Blue Ribbon Task Force
Delta Vision

Our Vision for California's Delta

Third draft prepared by staff (revised November 19, 2007)

Revisions based on discussion at the Blue Ribbon Task Force meeting October 25-26, 2007

Please submit comments online to: dv_context@calwater.ca.gov
or by mail to:
Delta Vision draft
650 Capitol Mall, 5th Floor
Sacramento, CA 95814

Executive Order S-17-06 charges the Delta Vision Blue Ribbon Task Force with developing a durable vision for sustainable management of the Delta by January 1, 2008, and a strategic plan to implement that vision by October 2008. The full text of the EO and information about Delta Vision are available at: http://www.deltavision.ca.gov/

The Blue Ribbon Task Force will make its vision recommendation at its meeting November 29-30, 2007. Drafts will proceed through three rounds of public comment between meetings, public comment at Task Force meetings, analyses by experts, and discussion among members of the Blue Ribbon Task Force. Here are the steps:

- August 31 – Task Force directs staff to prepare first, embryonic, draft of their vision
- September 12 – first, embryonic draft prepared by staff released for public comment
- September 20-21 – Task Force meeting, with public comment, leading to direction to staff to prepare a revised draft
- October 18 – second draft released for public comment
- October 25-26 – Task Force meeting, with pubic comment, leading to preliminary decisions on parts of the vision and direction to the staff to prepare a revised draft
- November 22 – third draft released for public comment
- November 29-30 – Task Force meeting, with public comment, leading to final recommendation on vision and direction to staff regarding work plan for strategic plan to be completed by October 2008

Important information continues to be developed regarding critical issues and the Task Force will wait for that information when possible. On the critical issue of alternatives for conveyance of water out of the Delta, for example, important information will become available through November. Similarly, important information is developing on improving Delta ecosystem function.

The Task Force is also developing recommendations for near term actions separate from this vision.

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Draft prepared by staff for public comment. Not approved by the Delta Vision Blue Ribbon Task Force or any government official or agency. The Blue Ribbon Task Force will make its recommendations November 30, 2007.

I. Executive summary

The Delta is a regional, state and national treasure. Its unique combination of estuary, water supply, recreation and tourism, aesthetics, life style, and rural character make it a special place that we must recognize and protect.

The Delta is critically important to California but cannot be sustained as we know and use it today. Its unique character and its capacity to serve California are threatened by diversions of water, urbanization, flood and seismic risks, and invasive species.

For the past 150 years, Californians have viewed the Delta as a place to farm or fish and as a source of water for use elsewhere. We gave little thought to the environmental consequences of these actions. Levees built 100 years ago confined water to channels and transformed the Delta from marshland into dry "islands" of land available for human use. In the 837,594 acres in the Delta and Suisun Marsh, levees confine water to 10 percent of the total area, with agricultural uses in 557,896 acres. There are now 1300 miles of levees in the Delta - a longer stretch than the entire California coastline. When levees were built, most celebrated the new farmland and few thought of what might be lost. There were no regulatory policies to make people consider the impacts of levees on the ecosystem. Similarly, many water diversions upstream and within the Delta were made before the public demanded environmental protection.

In later years, the channels built to create farmland were used to export water from the Delta. The federal Central Valley Project and the State Water Project, built from the 1940s through the early 1970s, changed the natural flow of water in the Delta and reversed the flow of the San Joaquin River.

Today more than half of Californians rely on water conveyed through the Delta for at least part of their water. Residents and businesses near the Delta and San Francisco Bay area are most dependent on water from the Delta and its watershed. Urban areas south of the Tehachapi Mountains also use water exported from the Delta. Much of California's agriculture depends on water from the Delta watershed; 1/6th of all irrigated lands in the nation are in this watershed. Agriculture in the southern San Joaquin valley relies heavily on water exported through the Delta.

In addition to water diversions and exports, other factors have changed the Delta or threaten large changes in the future. Invasive species have changed basic aquatic food production chains in the Delta. Ninety-five percent of living organisms in bottom samples are non-native species.

Almost 400,000 people lived in the Delta and Suisun Marsh in 2000, and nearby suburbs are moving into lands at the edges of the Delta needed for flood bypasses and habitat.

Many levees in the Delta were built with minimal engineering. As land dried out and was farmed, it subsided. Some islands are now more than 20 feet below sea level. In most years, at least one

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The Sacramento – San Joaquin Delta, incorporating also Suisun Marsh,

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Deleted: It is part of the largest estuary on the west coast of the Americas and a key part of the water supply system for the majority of California's people. California's Delta supports billions of dollars of annual economic activity, offers habitat or migration passage to dozens of critically important species, and is the location of housing, jobs and recreation to millions.

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Deleted: The Task Force identifies **the water system and the ecosystem of the Delta as co-equal values** that must be preserved on equal footing. California cannot sacrifice either the unique estuarine ecosyster ... [2]

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levee fails from floods or other events. Earthquakes could liquefy soils, destroy miles of levees, and threaten the many roads, water aqueducts, electricity lines and gas pipelines that cross the Delta and are critical to the state's economy. The risk of earthquakes is growing as pressure builds in nearby faults.

Climate change is also bringing risks. It may increase the severity of winter storms and floods that could damage levees and threaten people and infrastructure. The sea level may rise 28 to 55 inches by 2100 – more if large ice sheets melt.

New societal values and laws require changes.

As the public has come to understand these problems, societal values have changed. Over the past 45 years, California's legislatures have passed many laws to protect the environment, water quality, and endangered species. California's governors have led regulatory efforts to ensure that water projects and diversions are judged on how they impact the environment. The federal government has followed suit.

Since the Delta is a critical natural resource and also the hub of a major part of California's water supply, negative environmental impacts in the area are a matter of statewide concern. In summer 2007, the pumps of the State Water Project were stopped and the pumps of the federal Central Valley Project reduced to minimum operations for several days because of severe declines in Delta Smelt.

California law provides for both environmental protection and the use of the state's waters. The reasonable use and public trust principles of the California constitution provide a strong legal foundation for weighing water demands and uses.

In the past, much of the debate about water supply has focused on "conveyance" solutions – that is, on physical structures and on management that moves water around or through the Delta. This approach generally leaves other issues as either "mitigation" or afterthoughts to the conveyance scheme being discussed. Our vision is a more holistic and broad ranging. We must address statewide water use, governance, population growth, public safety, public service infrastructure, long-term climate change, ecosystem threats within and outside the immediate Delta, seismic risk, and the character of the Delta as a place. From this perspective, decisions about conveyance are not the starting point but the final piece of the puzzle. Decisions about conveyance will flow from policies that address the full range of concerns. All of these policies must be implemented effectively for water to be exported reliably from the Delta.

This is the time to act. The difficult choices we face today will become more difficult in the future. Procrastination will result in irretrievable losses – severe reductions in water uses and severe damage to the estuarine ecosystem.

The Delta Vision Task Force was created to "develop a durable vision for sustainable management" of the Delta. Its objective is to "restore and maintain identified functions and values that are

Deleted: This principle does not imply that these two values can somehow be held in balance in every policy or management decision at every scale. Rather, it asserts that each is indispensable to the state as a whole and that the sum total of our actions must secure the future of both. This will

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Deleted: . The history of the Delta has been to secure water supplies first and then worry about environmental mitigation later. The levee construction that transformed the Delta from predominantly marshy areas into dry "islands" protected by levees which confined water to channels occurred before much appreciation of what was lost. Those transforming levees were also constructed in the absence of effective regulatory policies focused on ecosystem effects. Similarly, many water diversions from rivers in the Delta watershed or from within the Delta occurred before passage of the endangered species acts. Even unde ... [3]

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determined to be important to the environmental quality of the Delta and the economic and social well being of the people of the state."[2]

A workable vision must include change in current policies and behaviors to achieve:

- **a comprehensive approach,**
- **clear priorities among uses,**
- **policies to address critical issues more effectively,**
- **science-based, adaptive actions, and**
- **a sound institutional foundation.**

Our vision for the Delta and for California includes twelve interrelated elements:

1. **The Delta ecosystem and a reliable water supply for California are the primary, co-equal goals for sustainable management of the Delta.**
2. **The Delta ecosystem must function as an integral part of the San Francisco Bay estuary.**
3. **California's water supply is limited and must be managed well to be adequate for its future population, growing economy and vital environment.**
4. **The California Delta is a unique and valued area, warranting special protection by the State of California.**
5. **The principles of reasonable use and public trust in California's constitution provide a sound legal foundation for policymaking about California water resources and are particularly important to the Delta.**
6. **The goals of sustainable use and conservation are the foundation for all of California's water policies.**
7. **A revitalized Delta ecosystem may require reduced diversions, or changes in patterns of diversions upstream, within, and exported from the Delta.**
8. **Water storage capacity and improvements in the system of water export relying on the Delta are linked, and are a key part of California's water future.**
9. **Major investments in the California Delta must pursue specific policies in this vision.**
10. **Strategic investments must strengthen selected levees, improve flood plain management, and improve water circulation and quality.**
11. **The current boundaries and the current governance systems of the Delta must be changed.**
12. **Institutions and policies for the Delta should be designed for resiliency and adaptation.**

Deleted: In addition, all uses of Delta water and land rely on the 1300 miles of levees that define the Delta landform and water conveyance system. These are vulnerable to failure from earthquakes, floods, and structural deterioration. A multiple levee failure event in the Delta could flood dozens of islands, badly damage the ecosystem, and entirely halt water exports from the Delta for years. Over time, **reliance on levees should be reduced**. However, levees will remain critical to the future of the Delta and new policies are needed to **match levels of protection provided by various levee designs to uses allowed** in areas flooded when levees fail.

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Deleted: Part of designing for resiliency is building a margin of safety for key ecological, water supply and public safety functions in the short term. Any vision for the future of the Delta will be accomplished over decades, during which time the safety of those living in the Delta must be protected, and methods found to ensure ecosystem functions and adequate water supply for human uses among all Californians dependent on water from the Delta watershed.

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[2] Executive Order S-17-06 is attached as Appendix 2. The Executive Order specifies a number of factors to be addressed which are incorporated into this vision and will be further developed during the strategic planning phase of Delta Vision in 2008.

Improved levees, more ground and surface water storage, changed conveyance, and mitigation projects are needed and must occur. But they are insufficient to satisfy the intergenerational charge to Delta Vision. Achieving a durable vision for sustainable management of the Delta requires urgent and integrated action. Delay or selection of some elements of this vision while ignoring others will lead to failure.

Table of contents:

I. Twelve interrelated elements in the Delta Vision

The Delta is critically important to California but cannot be sustained as we know it today.

The Delta is a regional, state and national treasure. Its unique combination of estuary, water supply, recreation and tourism, aesthetics, life style, and rural character make it a special place that we must recognize and protect. Its unique character and its capacity to serve California are threatened by the harmful effects of diversions of water throughout its watershed, encroaching urbanization, flood and seismic risks, and invasive species.

The Delta Vision Task Force was created to "develop a durable vision for sustainable management" of the Delta. The objective is to "restore and maintain identified functions and values that are determined to be important to the environmental quality of the Delta and the economic and social well being of the people of the state."

Changed systems of water storage and conveyance, even with mitigation of environmental impacts required by endangered species acts, are not enough to make the Delta ecosystem sustainable. Nor can those actions ensure reliable water supplies for Californians two or four generations from today.

Improved levees, more ground and surface storage, changed conveyance, and mitigation projects are needed and must occur. But "fixing" water supply alone will fail to provide reliable water supplies. And "fixing" the ecosystem alone will jeopardize needed water supplies. "Fixing" levees alone will freeze in place current problems in both water supply and negative environmental impacts. "Fixing" the Delta without making basic changes in policies and institutions will fail as storms, sea level rise, earthquakes, invasive species and urban growth pressures force change.

This is a draft vision of the independent Delta Vision Blue Ribbon Task Force. A vision is a picture of a hoped-for end result: what it would look like, how it will function, and what it will produce.

Please submit comments online to:
dv_context@calwater.ca.gov
or by mail to:
Delta Vision draft
650 Capitol Mall, 5th Floor
Sacramento, CA 95814

Success in meeting the charge to Delta Vision requires:

- a comprehensive approach,
- clear priorities among uses of the Delta,
- policies to address critical issues more effectively,
- science-based adaptive actions, and
- a sound institutional foundation.

Integrated, comprehensive action is needed; delay or selection of some elements of this vision while ignoring others will lead to failure.

This is the time to act. Choices that are difficult today will only become more difficult in the future. Procrastination may result in irretrievable losses in critical values associated with the Delta – either severe reductions in water uses or severe negative changes in the estuary ecosystem.

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Finally, **a durable vision for sustainable management of the Delta must be comprehensive**. It must integrate the values of ecosystem function and water supply, ensure that conservation and construction both occur and develop effective systems of storage and conveyance for water. The State of California must take a lead in developing and pursuing this vision, but it must also find effective ways to ensure joint action with the federal government and local governments, plus mobilizing the focused energies of Californians.¶
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The vision accomplished: In the 22nd century, California's Delta is a vibrant and safe place to live, work and recreate. It is a place where the heart of California beats to a strong, steady rhythm of river flows, estuarine life and human activity.¶

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As this vision is realized, California's Delta will be a place where foresight, learning and flexibility have resulted in a fruitful integration of the environment and the economy. In the 22nd century, California's Delta is a showcase for the nation and the world of how to integrate nature and technology. In the 22nd century, California's Delta functions as an effective estuary, teeming with life. In the 22nd century, Californian's have reliable supplies of high quality water from many sources, including the Delta. ¶
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Actions required to achieve this vision for California's Delta¶
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<sp>A successful vision states important values, provides a common understanding of the desired goals, and motivates broad commitment and action. Achieving a vision requires contributions by governments, individuals, businesses and non profit organizations. One challenge in achieving a vision is identifying the institutions and public policy strategies by which it can be achieved. Another challenge is mobilizing the energies needed to pursue those strategies, often in the face of opposition, and to adapt strategies over time as experience reveals unexpected consequences or science or technology afford new opportunities. T... [9]

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Our vision for the Delta and for California includes twelve interrelated elements:

1. **The Delta ecosystem and a reliable water supply for California are the primary, co-equal goals for sustainable management of the Delta.** California's water supply and the ecological resources of the Delta are both of paramount importance. They are co-equal: each is indispensable to California as a whole and our actions must secure the future of both.

   Current uses of Delta water – including diversions upstream, and within the Delta as well as exports – are a major barrier to a "durable vision for sustainable management of the Delta."

   But problems in the Delta can be solved only as part of a comprehensive effort to improve statewide water management and ecosystem management. Failure to protect the estuary could result in an inland salt sea or collapse of an estuarine ecosystem with loss of protected and desired species. The consequences for statewide water supply would be unacceptable. The loss of a reliable supply of water from the Delta could lead to substantial economic hardships because large fractions of the state's water supply must come from the Delta watershed. Some of this water must be exported from the Delta to other parts of the state.

2. **The Delta ecosystem must function as an effective part of the San Francisco estuary.** The goal for the Delta should be to create a more heterogeneous estuarine environment, including a diverse habitat mosaic, expanded areas of seasonal and tidal wetlands, effective connections between the estuary and the larger landscape and fresh water flows of the right temperatures at the right times. At present, the Delta does not function robustly as an element of the estuary.

   The Delta cannot be returned to a pristine state and the Delta cannot be armored against all future changes in nature. It can and should be reconstituted to function more fully as an estuary, to better support native species and recreational fishing and, importantly, to be resilient to future change in ways that achieve desired goals. As we take steps to improve habitats and establish more natural flood flows, we must design these policies carefully, constantly monitor and analyze results, and adjust policies as our knowledge increases.

   Efforts must also be made to reduce the number of invasive species and to monitor and manage the impacts of these species.

3. **California's water supply is limited and must be managed well to be adequate for its future population and growing economy.** It is possible to achieve this goal only if we Californians change our policies and our habits of water use. There is no unlimited supply of cheap water in California. Greater conservation, increased regional self sufficiency in water supplies, more conjunctive uses, integrated water system management and demand management, and new technologies will all be essential. In addition, the state should seek equitable access to higher quality water sources.

4. **The California Delta is a unique and valued area, warranting special protection by the State of California.** The Delta is a place of natural beauty, with historic towns, productive farming and close-knit communities. The Delta is an integral part of the largest estuary on the west coast of the Americas, connecting rivers originating in the Sierra Nevada to the Pacific Ocean. The Delta is also an indispensable part of the Pacific Flyway. These values should be preserved in any vision of a future Delta.

   The Delta has been defined in state legislation and recognized by the federal government as part of the San Francisco Estuary. The state should take steps to increase the visibility of the Delta as a unique and valued area. This would help create a statewide public identity for the Delta and encourage expanded tourism and recreational investment. For purposes of discussion of appropriate designation and protection, the name "California Delta Resource Area" will serve.

   Protecting California's Delta from encroaching urbanization is critical both to preserving its unique character and to ensuring adequate public safety and emergency response. Land use and governance considerations will be particularly important in that effort.

5. **The principles of reasonable use and public trust in California's constitution provide a sound legal foundation for policymaking about California water resources and are particularly important to the Delta.** There are inevitable conflicts between protection of the ecosystem and provision of water for California. Application of the twin principles of reasonable use and public trust is the best way to determine how these competing values will be addressed.

6. **The goals of sustainable use and conservation are the foundation for all of California's water policies.** California must manage its natural resources sustainably to accommodate its growing population and economy. We must start by requiring and investing in water conservation by all users throughout the state. The fastest ways to address the growing demands for water are to conserve and to increase the efficiency of the water supply system. These efforts can start almost immediately. In contrast, building more water supply capacity can take years – or decades if there is litigation. Vigorous conservation efforts can be productive as far as we can see into the future.

7. **A revitalized Delta ecosystem may require reduced diversions, or patterns of those diversions, upstream, within the Delta and exported from the Delta**. Water diversions upstream threaten the Delta ecosystem, as do Delta exports. Similarly, diversions for use within the Delta, largely for agriculture, affect the health of the Delta. Some diverted water is ultimately returned to the Delta but almost invariably these return flows are of poor quality. Projected changes in snow pack because of climate change and increased diversions upstream of the Delta will also affect quantities, timing and quality of water reaching the Delta.

8. **Water storage capacity and improvements in the system of water export relying on the Delta are linked and are a key part of California's water future.** All Californians want their water supplies to be regular and reliable. But history shows us that there are no

guarantees about when or how much rain and snow will fall. We build dams or fill underground water aquifers in wet years so we can use the water in dry years or at dry locations.

Different users want water on different schedules. Urban users want water on a consistent schedule. Agricultural users want water when crops need it. Agencies responsible for species protection and ecosystem function want flows that follow natural patterns of high flows, floods and lower flows, and they want water when protected species need it. Different users also want water in different places. Current storage and conveyance systems often fail to meet competing expectations or even to allow accurate short-term predictions of water availability.

We need to sort through these diverse requirements and to develop a system that is less reliant on the fragile nature of the Delta and on the legal constraints of meeting the needs of endangered species. Any construction or change in the operations of conveyance facilities in the Delta must be "coupled" to the construction and operations of storage facilities to ensure that the physical structures, timing, and operations of all facilities can be managed to meet all competing needs – for both environmental and economic uses. For example, new storage facilities for surface waters or groundwater and on the floodplain should capture water when and where they would be least damaging to the environment.

One way to manage water exports is to create isolated facilities that take water around the Delta. Perhaps this would enhance the reliability of exports, create fewer problems for selected species, be less exposed to seismic risk, and result in higher water quality. But at this point, there is not sufficient specific information to guarantee these outcomes.

Similarly, the concept of a "dual" conveyance, joining an isolated facility to improved conveyance through the Delta, might increase reliability and capture more high-water flows, but again, not enough information is available at this point to ensure this.

Advocates of improving through-Delta conveyance argue that it will protects those who draw water from the Delta and will also create incentives to both to water exporters and those who use water in the Delta to invest in maintaining levees and fresh water flows through the Delta. But specific information about water quality, costs, seismic risk or meeting species protection laws is still incomplete.

Any decision about conveyance and related storage must meet the standards of the California Environmental Quality Act (CEQA) and federal and state endangered species acts. The Bay Delta Conservation Plan has the goal of satisfying the California Natural Community Conservation Planning Act and the federal Habitat Conservation Plan act to address species protection laws. The analyses for CEQA and species protection statutes are necessary and important. But the eventual decisions about conveyance, storage and mitigation are only a part of what California must do to secure future needed water supplies and protect ecosystems as climate change alters water availability, sea level rise inundates more areas, and population and economic growth increase demand for water.

The goals of reliable water supply and functioning ecosystems will be achieved by recognizing the interdependence of all elements of a sustainable Delta vision and making decisions about conveyance and storage within that larger perspective.

To that end, analyses of conveyance and storage should not focus just on the immediate Delta and satisfying CEQA or NCCPA, as limited analyses cannot provide needed information in important areas such as full economic impacts or life cycle costs. The analyses launched in 2008 must go beyond conveyance, storage and project mitigation to assess how the full set of policy choices from this vision will serve California for 70 to 100 years. In final policy making, the specifics of conveyance and storage can be expected to be less than half of what is needed to meet the charge to the Delta Vision Blue Ribbon Task Force found in Executive Order S-17-06.

CEQA analyses on conveyance and storage should begin in early 2008 and analyses related to the broader perspective should begin simultaneously. As entry points into the CEQA analyses, the choices regarding conveyance and storage could be structured as:
ALTERNATIVE LANGUAGE TO BE SELECTED BY TF:

(a) A dual conveyance system as the preferred alternative, focused on understanding the optimal combination of through Delta and isolated facility improvements, or

(b) An isolated conveyance as the preferred alternative, or

(c) A process should be launched to assemble available information (including expert judgment where needed) on design features, cost and performance of alternative conveyance and storage systems against specified criteria to allow selection of a preferred alternative by June 2008, or

(d) Insufficient information exists to identify a preferred alternative at this time and cannot be developed by mid 2008 but a CEQA process should be launched in early 2008 without identifying a preferred alternative, thus giving even-handed deliberation to key alternatives.

Each alternative storage and conveyance system must be evaluated in regard to the full range of Delta resources and services, not just species listed under the state or federal endangered species acts but also estuary ecosystem function, water quality and water supply reliability goals, and impacts on the other factors identified in Executive Order S-17-06.

The Delta Vision Strategic Plan will provide much of the context for such evaluation. Benchmarks for assessing progress toward critical goals should also be developed drawing on contributions from scientists, agency managers of programs and knowledgeable citizens.

Since constructing any major improvements in storage and conveyance will take several years, current systems should be protected and improved. This will require strategic investments in the near term while final design and assessment of longer-term alternatives are completed.

9. **Major investments in the California Delta must pursue specific policies in this vision.** Over the next few decades, billions of dollars will be spent to improve the estuary's ecosystem and levees, as well as the California's water systems. Unless these investments are made in pursuit of clear goals, they will be of limited value.

   Investments in statewide water conservation or regional self-sufficiency efforts are essential, and of immediate utility.

   Beneficiaries must pay their appropriate share of these investments and also share in the risks and possible liabilities of action.

10. **The current boundaries and the current governance systems of the Delta must be changed.** Current governance systems are inadequate to the challenge at hand and must be changed. The new governance system needs a single entity with a statewide perspective to ensure integrated action to implement this vision. This single entity would have the capacity to apply the constitutional principles of reasonable use and public trust to ensure that the co-equal priorities of protecting and improving the Delta ecosystem while also making a reasonable amount of water available for human use.

    The single entity must

    a. have sufficient authority, including authority over ecosystem improvements and water diversions and exports;

    b. have sufficient financing to sustain activities over decades, including ability to impose fees on those who use water resources from the Delta watershed or otherwise impact the Delta ecosystem;

    c. have clear, effective working relationships with federal and local agencies and officials;

    d. incorporate contributions of stakeholders, probably developed through structured collaborative processes, and

    e. be supported with state and federal policies that align the incentives and costs that individuals, businesses and others face with a sound long-term vision for the Delta.

    In addition to this single entity, other structures will be needed to address critical issues or to provide arenas for stakeholders and experts to participate in decision making processes. For example, the responsibility to ensure that land use decisions about specific parcels within the Delta planning area are consistent with the vision and will implement the policies of the single governance entity should be vested in a separate body that includes a substantial number of relevant local government officials.

    This governance system must be supported by robust programs of science focused on improving understanding of the Delta and of the effects of policies and programs.

11. **Strategic investments will strengthen selected levees and improve flood plain management.** Significant Delta levee improvements must be made to protect urban populations, key islands needed to control salinity, water conveyance and reconfigured infrastructure corridors. There will not be enough money to improve all levees. Funds should be allocated to match level of protection required. Levee design should focus on recoverability, not impenetrability.

    Over time, reliance on levees should decrease. New urban development should be restricted in flood prone areas, including areas below projected sea level, all areas of deep floodplains, and areas necessary for flood bypasses and floodplains. Protecting, restoring and enhancing flood plains that can reduce flood risks and reduce the strain on levees in the Delta should be a high priority.

12. **Institutions and policies for the Delta should be designed for resiliency and adaptation.** There are no simple fixes for the Delta. There are significant uncertainties about both important natural processes and the effectiveness of human engineering and policies. Over the coming decades, California's Delta will be subject to powerful external sources of change. Some of these sources are natural, like floods or earthquakes. Humans contribute to other sources of change, like population growth and urban development, introduction of invasive species or climate change. These external forces of change mean the physical configuration of the Delta as it exists today is not stable. Policies seeking to maintain a static Delta against these changes will fail.

    The Delta will change. Achieving sustainable management of the Delta means designing physical and institutional forms that will allow the system as a whole – and the critical economic and ecological functions it provides – to survive what could otherwise be catastrophic shocks.

    These factors argue for designing for resilience, the capacity to avoid catastrophic failure, and ensuring capacity for adaptation. Robust science and public understanding will be critical to support effective policy making and operational management required for adaptation.

II. Polices to achieve the vision

A successful vision states important values, provides a common understanding of the desired goals, and motivates broad commitment and action. Achieving a vision requires contributions from everyone--governments, individuals, businesses and non-profit organizations. Achieving a vision presents several challenges. One challenge in achieving a vision is recommending public policy strategies and identifying the institutions that can carry out these recommendations.

a. The "California Delta Resource Area" as a unique and valued place

Though little recognized by many Californians, the Delta is a region of unique and irreplaceable cultural value. It is a place where Native Americans lived and harvested food, where river travelers have long passed between the Central Valley and the ocean, where America's only rural "Chinatown" was built and still stands, and where industrious farmers invented entirely new implements to work the unique Delta soils. In more recent times, it has been a recreational haven to millions of Californians, offering valued boating, fishing, hunting, and bird-watching – or simply the chance to

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partake of a slower pace of life for a time. Its agricultural lifestyle and rural quality of life contrast sharply with the intense urbanism of the Bay Area, Stockton, and Sacramento. (Figure 1. Map of the Sacramento-San Joaquin Delta and Suisun Marsh).

Figure 1. Map of the Sacramento-San Joaquin Delta and Suisun Marsh

From wine grapes, blueberries and pears to rice, corn and tomatoes, the Delta grows more than 90 different crops, producing more than $650 million in farm sales for the California and Delta economies. The combination of fertile soils, a marine-influenced climate, proximity to market and the accumulated experience with this unique farm region of generations of farming families, makes the Delta a key and valuable part of California's famed diverse and rich agricultural bounty.

The Delta must change, but its core values as a unique place must be preserved and enhanced in the future. With millions more people arriving in northern California over the coming decades, the Delta's role as a recreational retreat will become even more valuable than it is today. Indeed, with its rich mixture of habitats, farmlands, open spaces, watercourses, fisheries, and historic towns, the Delta could become a compelling new kind of tourist destination that mixes ecosystem restoration, outdoor recreation, and an active local economy. In addition, the Delta is home to several key infrastructure systems of statewide importance, including highways, railroads, aqueducts, and electricity and natural gas lines, which cannot be allowed to fail for long periods of time.

For all these reasons, there must be increased recognition, increased status, and increased protection of the Delta as a place, not just a water supply or a species habitat. The goals of regenerating the Delta and securing critical infrastructure should not diminish the cultural and recreational value of the Delta. On the contrary, these should be mutually supporting. New investments to meet ecosystem and water supply objectives can complement efforts to enhance the Delta's recreational and tourism, and agricultural, economies and should not diminish disaster protection for critical infrastructure.

The Delta's land use pattern must enhance both the region's unique values and the overall resilience of the system. To preserve the Delta's place values, the region's landscape should continue to be dominated by agriculture, wildlife habitat, and recreation, with mutually beneficial mixtures of these wherever possible. Specialized forms of agriculture that are particularly well suited to the Delta must be encouraged, such as subsidence-reversing crops, carbon-sequestering crops, and wildlife-friendly farming practices.

The Delta's recreation and tourism economies also should be the subject of active investment and promotion by private, non-profit, and governmental entities over the coming decades. Rather than being frozen in time, the Sacramento River legacy towns, the agricultural areas, and the wildlife habitats that attract visitors today should be allowed to change in ways that are consistent with the Delta Vision. New enterprises that present the Delta's values to the larger public should be allowed and encouraged. For example, the mutually beneficial co-existence of habitat restoration, recreation, agriculture and public education that takes place as part of the collaboratively managed Yolo Bypass Wildlife Area could be replicated elsewhere in the Delta.

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Far from being a prescription for paralysis, however, recognizing both uncertainty in knowledge and uncertainty about outcomes of policies and programs has very specific implications for future Delta management. Managing a valuable resource of any kind under conditions of uncertainty calls for common sense wisdom – spread risks, create backups where possible, work in reversible steps, and learn from experience. The state must act decisively and deliberatively to reduce known threats, but must also adopt a long-range stewardship philosophy that results in a resilient Delta environment and a resilient state water supply system.¶
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Fragile systems are those in which much relies on a few brittle parts, an accurate description of the Delta ecosystem and water conveyance systems today. Resilient systems are those with multiple mutually supporting parts, functional redundancies, and the capacity for gradual (not catastrophic) change in response to new conditions. Resiliency is necessary for the future. The Delta's large physical size and complex array of land forms and water channels are assets for achieving resiliency, since they can distribute functions and risks over a large, diverse area. Figure 1 shows the Delta, a uniquely inverted form.

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To enhance the resilience of the system, however, land use choices should both protect human residents of all economic levels from disaster, and preserve management flexibility for the Delta over the long term. Housing development must be kept out of all flood-prone areas, including all areas below current or projected sea level and all areas in deep floodplains, whether within or outside of the existing Delta primary zone. Protection of human life is of supreme importance, and Delta floodplains are a fundamentally unsafe place for housing development even with new investments in levees.

Equally importantly, new housing development cannot be allowed to compromise the flood protection for existing Delta residents and businesses. New housing developments in floodplains constrain flood conveyance capacity and can increase the threat of levee failure in surrounding areas and downstream. Areas suitable for the creation of new flood bypasses to protect existing Delta residents and services must also be kept free of housing developments. Recent court decisions on liability for levee failure have heightened the urgency of these issues for the state government.

Finally, land use policy must recognize that many areas at the Delta periphery that are under the greatest pressure for urbanization are also indispensable to the long-term management of the ecosystem and water supply. As sea level rises, the geographical areas suitable for tidal wetlands regeneration will shift accordingly – but only if they have not been paved over or cut off by levees. Floodplain habitats on all rivers entering the Delta can provide crucial rearing and migration habitat for key fish species, but these functions would be greatly diminished by the presence of housing developments. Lastly, the most logical rights-of-way for any isolated conveyance facilities also pass through areas that are under significant urbanization pressure.

Even the expectation of future development will make preservation of these key Delta functions dramatically harder. Habitat restoration and water conveyance routing require land acquisition that will be far more expensive if land prices are determined by speculation on future development. As a result, efforts should be made to prevent a rush to establish development entitlements before appropriate Delta protections are in place.

Given the fragmented nature of institutions in the Delta today, this coordination will be best achieved by a new planning area that encompasses (but does not replace) the existing boundaries of the Delta Protection Commission. The geographical boundaries of this planning area should extend beyond the existing legal Delta to incorporate adjacent areas where land use choices will have a substantial impact on the fate of the legal Delta. This boundary also should be set in accordance with a relevant, coherent and defensible ecological or hydrological criterion, such as a future high-tide line or elevation line.

Much of the Delta consists of lands subject to the ebb and flow of the tide. These lands are subject to what is commonly known as the public trust, under which the State of California holds them subject to a duty to see that they are used so as to preserve the people's interest in such trust purposes as commerce, navigation, fisheries and ecological study. Generally speaking, the State of California's interest in the tidelands extends to the mean high tide mark (as opposed to the public trust interest in fresh water, navigable waterways, which extends to the ordinary high water mark).

As sea levels rise due to global climate change, the mean high tide mark will move farther up the land in and around the Delta. In planning for the future of the Delta, and of immediately surrounding lands that may be subject to tidal influence, state and local agencies have a duty to avoid activities that would injure trust purposes whenever feasible, and to mitigate them if they are unavoidable.

The proposed planning area must clearly designate the Delta as a special area, and should help inspire and guide investments in ecosystem regeneration, land acquisition or protection, and the recreation, agricultural and tourism economy. The investments themselves, however, should be made by a variety of actors, including private entrepreneurs, non-profit organizations, and government at all levels. This planning area must also ensure that all such investments conform with the overall regional management goals of ecosystem regeneration, water supply reliability and quality, human safety, and preservation of the Delta's unique value as a place.

b. Policies to achieve a more resilient estuarine ecosystem

The Delta is an integral part of the largest estuary on the west coast of the Americas. It connects rivers originating in the Sierra Nevada to San Francisco Bay and the Pacific Ocean and productive upland with tidal marsh. Estuaries are subject to tidal influence, mixing salt, brackish and fresh water at different locations according to seasonal river flows and tides. This estuarine environment once teemed with fish and wildlife and is still essential to hundreds of species from crabs to mammals and fungi to grasses. Some of these are unique to the region, such as the Delta smelt and the Antioch dunes evening primrose. The Delta is also an indispensable part of the Pacific Flyway, an intercontinental migration corridor for hundreds of bird species. The Delta historically has supported lucrative commercial and sport fisheries of both native and non-native fish.

In developing policies to revitalize the Delta ecosystem, many ecological roles must be kept in mind. The Delta, the flyway, and the fisheries all provide great value to the State of California, both as tangible economic assets and as a trust that we must steward for future generations. Delta lands are also important elements of the Delta ecosystem and provide large value to the State of California. Delta levees are vital to protecting water as much as to protecting islands and infrastructure, and make critical contributions to the successful functioning of the Delta.

The Delta's ecosystem must be regenerated so that it functions more effectively as an integral part of the San Francisco Bay estuary, combining tidal and river flow patterns within appropriate physical habitat types characteristic of the historic Delta. The Delta must also contain thriving terrestrial habitats and sport and commercial fisheries that have been important to the northern California's culture and economy for decades. To meet these objectives, the different areas of the Delta will be managed differently.

The Delta ecosystem cannot be returned to its pre-European contact condition, when it was a vast sea-level tidal marsh. It is also facing powerful sources of change including rising sea levels and water temperatures, and the prospect of sudden changes in habitat structure caused by levee failures. Given these facts, a desired Delta ecosystem should not be defined in terms of a static "end

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Governance¶
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California's Delta is its largest estuary and lies at the center of a complex statewide water system that combines the massive engineered state and federal water projects with a diverse range of local water management activities. But despite its importance to California, uses of the Delta are not governed effectively. There is no coherent vision for the future of the Delta that effectively addresses the increasing threats and only weak ways to organize the existing agencies and jurisdictions toward broad purposes. There are also numerous legal, regulatory, and economic incentives to misuse or overuse Delta water that ensure a constant over-subscription of the resource.¶
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No improvement in the Delta estuarine ecosystem, and no protection of existing exported water, is possible without new, effective governance. There are at least 220 governmental agencies with some authority for aspects of the Delta. We know of no individual who defends the current system of governance. Instead, almost everyone insists that a 'new governance structure' is needed. We agree, and will make our recommendations later. Pending that, however, the future governance system for California's Delta must be granted wide authority and have as its focus the achievement of the dual priorities we have identified: a protected and improved Delta ecosystem, and providing a reasonable amount of water for human purposes.¶
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An effective governance system must do the following:¶
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<#>Make progress on the two critical values of ecosystem function and water provision while incorporating the other values society seeks through the Delta. ¶ ... [10]

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state," but rather in terms of the beneficial functions and uses that it provides, and the resilience of those functions and uses to external disturbances.

When CALFED began, the scientific conceptualization of how the Delta worked was derived mainly from the long history of research on east coast estuaries. CALFED greatly increased the research on the upper San Francisco estuary, particularly the Delta, gathering new data and synthesizing information from 30 years of monitoring conducted by the Interagency Ecological Program, U.S. Geological Survey, and other agencies. The result has been a greatly improved understanding of the Delta as part of a unique ecosystem and a much firmer foundation for planning effective ecological restoration. As we enter a new era of water and environmental management in the Delta, an era that will be characterized by important changes in hydrology, climate and land use, it is imperative that we strengthen the science infrastructure in support of the new vision for the Delta.

Applied science, particularly science supported through the CALFED Bay-Delta program, provided the foundation of understanding that identified the need for a new vision. One of the most important results of research focused on the Delta was a clear recognition that the Delta is threatened by impending change, that the Delta of today is not sustainable. Despite our growing understanding of the Delta, and California's water supply, the future remains uncertain. Adaptive management provides an effective tool for addressing future uncertainty and is heavily dependent on a solid infrastructure for science. Focused Delta science as part of a system of adaptive management will be an essential component of the new vision.

As an estuary, the important functions of the Delta are the patterns of food production, nutrient distribution, water flow, migration, salinity, water temperature, and more. The entire web of estuarine relationships must be rewoven and sustained. Estuaries are variable environments by nature, and therefore the Delta should incorporate enough of that variability to achieve the desired functions and processes. This will be especially true in the longer term, as climate change makes it more and more difficult to sustain relatively constant conditions. Figure 2 shows the positive results from functioning habitats. (Figure 2. Better habitat equals greater growth)

Figure 2. Better habitat equals greater growth of fish

In any ecosystem, ecological functions are a product of a given physical habitat structure, and the ecological and physical processes that occur there, with additional influence from external stressors, such as pollution or powerful water pumping that alters currents.

All of these elements are of critical importance in the Delta, and all are limiting the success of desirable species in one way or another. For the Delta as a whole, a resilient, regenerated ecosystem will contain:

Physical habitat

1. Seasonal and inter annual patterns of freshwater flow into and through the Delta that will reestablish variable water residence time and floodplain inundation for the benefit of native species;

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2. Channel configurations that are more "dendritic" and contribute to variable water residence time and greater habitat complexity;
3. Tidal access to low lying marginal lands to encourage tidal freshwater and saltwater marsh development;
4. Patterns of sediment transport, deposition, and erosion that maintain appropriate turbidity as well as intertidal and shallow sub tidal land forms;
5. Broad corridors of natural and semi-natural habitats connecting marsh to extensive upland;
6. Geometry and topography that allows expression of the full suite of ecosystem types expected in a delta-estuary system;
7. Marginal land reserves that will allow upslope migration of wetland types in response to sea level rise.

Ecological Process

1. Enhanced processes of productivity and delivery of productivity to valued components of the ecosystem;
2. Restoration and expansion of ecosystem types on which rare and threatened species depend;
3. Enhanced processes that strengthen competitive ability of native species.

Stressors

1. Reduced impact of chemical stressors of all types on Delta species and ecosystems;
2. Reduced impact of established non-native species on native species;
3. Reduced opportunity for invasion of new non-native species;
4. Reduced or eliminated entrainment of desired species and food organisms into water intakes;
5. Reduced or eliminated effects of export pumping on flow patterns in the Delta.

Figure 3 suggests how actions at the northern edges of the Delta could enhance estuarine function. This is not a complete list, nor evaluated sufficiently to be specific recommendations, but illustrates how varied natural elevations in the area can be exploited to improve estuarine functions. (Figure 3. Illustration of improving estuarine ecosystem functions)

Figure 3. Illustration of improving estuarine ecosystem functions

c. Policies to achieve a more resilient water system for California

The principle of resilience also applies more broadly to the State of California's water system. The Delta's watershed is almost 40 percent of the land area of California and receives nearly half of the precipitation for the state. Large populations outside of the watershed are serviced by exported Delta water. As shown in Figure 4, precipitation in California has changed little in decades, though climate change projections suggest more rainfall than snow, reduced snow pack and more severe storms in the future.

Figure 4. Precipitation History (insert here)

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<#>a dendritic channel pattern, like veins of a leaf, with diversity of channel and flow conditions (physical habitat), ¶
<#>more natural patterns of freshwater inflow and outflow (physical process), ¶
<#>improved food web productivity, and better delivery of that productivity to desirable species, including the management of invasive species (biological process)¶
<#>management of water quality and sediment conditions for the benefit of desirable aquatic species (reduction of stressors), ¶
<#>reduction or elimination of the influence of export pumping on aquatic habitats (reduction of stressors), and¶
<#>capacity to absorb disturbances, and to accommodate experiments in variation of environmental conditions¶

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The amounts and characteristics of the water flowing through the Delta are profoundly shaped by the land uses, technologies, and human behaviors that occur in both of these areas. Figure 5 shows the Delta watershed boundaries on a map of California. (Figure 5. Map of Delta watershed boundaries.)

Figure 5. Map of Delta watershed boundaries.

Because of California's Mediterranean climate, the key challenge for the statewide water system has been to shift water from wet years, wet seasons, and wet locations to drier times and places. The California's major supply of water is from rain and snow that falls north and east of the Delta (with a relatively modest amount imported from other states). But the major demand for water is west and south of the Delta.

The Delta is an important, but not dominant, part of the California's water supply. A relatively small proportion of total state water flows into the Delta – 15 percent in a wet year, 13 percent in an average year and 9 percent in a dry year. But the Delta is more important than its share of water because it is the hub of the two largest waters systems in the state, the federal Central Valley Project and the State Water Project. These projects use the Delta as a hub of their water conveyance system; the Delta also plays that role in some local water systems, while other users divert directly from the Delta's waterways. Diversions from the Delta have increased dramatically over the past half century, as shown in Figure 6. (Figure 6. Diversions from the Delta.)

Figure 6. Diversions from the Delta.

The resilient California Delta treats the water supply and its ecosystem as co-equal values, each central to the future of the region and to California. In order for both to thrive, the ecosystem must be protected from the operations of the Delta pumps and other diversions from within the Delta or upstream. Achieving this protection must proceed in a staged and transparent manner, so the effects of any action upon both the ecosystem and the water supply can be fully evaluated as implementation proceeds. A series of performance standards, widely agreed upon by stakeholders, must be the basis for these evaluations.

As greater protection is achieved, management of both the water system and the ecosystem must proceed in an adaptive manner. In a system as dynamic as the Delta, and with climatic and other conditions changing in unpredictable ways, it is essential that management flexibility be preserved and exercised. This may mean creating multiple pathways for water conveyance so critical water supplies cannot be interrupted completely by levee failures, salinity intrusion, or other sudden changes.

All water conveyance should be designed to be quickly recoverable in the event of a major disaster. Designs for storage and conveyance should incorporate expectations of reduced diversions upstream, within and exported from the Delta during dry periods, and also the need to capture, convey and store water when least harmful to the environment. The systems of storage and conveyance should be designed to accommodate expected transfer of water from points of capture to points of use, recognizing such transfers are critical to meeting water needs but must be accomplished with least negative ecosystem impacts.

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New storage, both in ground and above ground, and improved conveyance must be constructed to capture water when least damaging to the environment and efficiently move it to areas of need. Building new conveyance alone, without new storage, would seriously compromise the ability to protect the estuary and provide sufficient environmental flows. Storage and conveyance must be coupled in order to operate the system with sufficient flexibility to protect both the environment and economy. The storage and conveyance systems should also meet water quality standards (which are tightening) and also allow operation of legal water markets.

Figure 7 shows how water from the Delta watershed is used both within that watershed, in coastal urban areas and in the Tulare Basin (where most use is for agriculture). As a result of these conveyance projects, the majority of Californians, in one way or another, use water from the Delta and its watershed. However, it is important also to understand that most water systems in California are local projects and that the State Water Project and the Federal project provide modest supplies of the total dedicated water used in the state. (Figure 7. Upstream and export diversion from the Delta watershed.)

Figure 7. Upstream and export diversion from the Delta watershed.

More water is commonly exported from the Delta in average or dry water years than is exported during wet years. In wet years, about 4.6 million acre-feet of water is exported from the Delta; in average and dry years, water exports are about 6.3 million and 5.1 million, respectively. The current infrastructure for water conveyance and storage limits ability to capture and store water during high flows for use in dry years. Figure 7 shows these relationships. (Figure 8. Water balance in the Delta by water year type.)

Figure 8. Water balance in the Delta by water year type.

This capture, storage and conveyance occurs under water rights law where the Central Valley Project or State Water Project, or other users, hold rights to divert water from upstream sources, store it in reservoirs and then convey it in canals and by pumps to points of use. Water is essential to human life and health, and human consumptive uses are the top priority for developed water supply in California under existing law. Water supply, regardless of source, also is an important part of the California economy. Thus, water is both an important natural resource and an important economic resource. There is great competition for the limited amount of developed water supply. A new attitude and approach to water supply development and water use must take hold in California.

Public trust principles, well established in the American legal system, with roots back to England and parallel principles in other legal systems, provides a way to frame decisions about the use of water in the Delta and Delta watershed. In our legal system, water is not owned by any user, but the State of California and public retain ownership. Users gain the right for use of water in various ways (riparian, appropriative, etc.,) but those rights are conditional both as stated in the term reasonable use, and by the underlying public trust for protection of the resource. Public trust princi-

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ples should provide an ethic and foundation for public policy making regarding water resources in all of California and is especially relevant and important in the Delta.

Reducing reliance on the Delta means building greater regional water self sufficiency throughout California. Most attractive storage opportunities have already been developed; there is a dam at almost every highly effective site. The sites left for building dams often have high environmental impacts or high cost for their yield. Therefore, there have been few major dams constructed in California recently.

Figure 9 details the water sources for urban uses in California, confirming the pattern just discussed. All urban areas of California rely on some water from the Delta and its watershed, but the proportions vary tremendously. (Figure 9. Estimated distribution of water sources used to meet daily urban water demand.)

Figure 9. Estimated distribution of water sources used to meet daily urban water demand.

California must also develop water from all available sources in order to reduce reliance on the Delta. Figure 10 is a summary of the analysis of potential water demand reduction or supply augmentation for eight strategies from Update 2005 of the State Water Plan. These strategies need to be further developed and pursued as possible. (Figure 10. Strategies to reduce demand for or increase supply of water.)

Figure 10. Strategies to reduce demand for or increase supply of water.

d. Delta levees

This vision's goals for the water system, for other infrastructure and the Delta as a unique place all require a reliable and recoverable levee system. Levees are the fine threads that stitch together the Delta waterways and landscape, and that make most current human uses of the land and water possible. As in New Orleans before Hurricane Katrina, however, the Delta's levees and the protection they provide are too often taken for granted. Levees require continual attention, investment and maintenance, especially in situations where they protect water supplies and also land below sea level. The care of Delta levees will therefore be a key responsibility for state and local government and Delta inhabitants, in perpetuity.

Given the risks of levee failures and the requirement for continuing maintenance against increasing threats, the State of California should adopt two policies:

1. California's reliance upon levees should be reduced wherever possible and avoided in the future. As an example, reliance of critical infrastructure on levees should be minimized where possible.

2. The State of California should adopt standards for levels of protection afforded by levees of different design and determine allowable land uses in areas flooded when levees fail.

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Deleted: Though little recognized by most Californians, the Delta is a region of unique and irreplaceable cultural value. It is a place where Native Americans lived and harvested food, where river travelers have long passed between the Central Valley and the ocean, where America's only rural Chinatown was built and still stands, and where industrious farmers invented entirely new implements to work the unique Delta soils. In more recent times, it has been a recreational haven to millions of Californians, offering valued boating, fishing, hunting, and bird-watching – or simply the chance to partake of a slower pace of life for a time. Its agricultural lifestyle and rural quality of life contrast sharply with the intense urbanism of the Bay Area, Stockton, and Sacramento. From wine grapes, blueberries and pears to rice, corn and tomatoes, the Delta grows more than 90 different crops, producing more than $650 million in farm sales for the state and Delta economies. The combination of fertile soils, a moderating marine-influenced climate, proximity to market and the accumulated experience with this unique farm region of generations of farm families, makes the Delta ... [14]

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However, allowing numerous levees to fail (either gradually or *en masse*) is not desirable because of the damage it would do to the Delta's regional economy even if water conveyance were secure. And yet, fully fortifying all of the levees against the many threats they face – ranging from earthquake risks to subsidence to climate change – would be astronomically expensive.

For these reasons, levee management must emphasize recoverability from, rather than resistance to, failures of all kinds.

e. Important policies outside the Delta are critical to achieving this vision

Because the Delta is central to California's natural hydrology and water system, any comprehensive vision to secure its future must include measures that take place outside of its legal boundaries. Indeed, in one way or another, much of the State of California is intimately connected to the Delta.

As has been noted, water conservation throughout California is essential to accommodate trends in long-term population growth, climate change, and disaster risk. Water conservation strategies must begin by recognizing that not all uses of water are equally valuable. Water is a public resource, subject to the public trust, to be managed appropriately for identifiable public benefit and preserved for future generations. The sustenance of human life, the conservation of ecosystems, and the supply of critical economic activities must be explicitly recognized as the highest uses of California's water in all local water management decisions.

In addition, the state and local water agencies must vigorously investigate all opportunities for conjunctive management of reservoirs, floodplains, and groundwater aquifers. Conjunctive management that infiltrates more wet-season runoff into the Central Valley's groundwater aquifers, for example, has the potential to reduce flood pressure on the Delta and to expand local dry-season supply. Conveying that water from surface reservoirs to infiltration sites through existing river channels can also help restore riverine habitats, especially in the dewatered reaches of the San Joaquin River. These conjunctive management strategies must also include the Tulare Basin, which, although not naturally hydrologically connected to the Delta, is a major consumer of Delta water for agricultural irrigation, and has very large groundwater storage potential.

III. Governance

The Delta combines extraordinary value, extraordinary risk, and extraordinary uncertainty all in the same place. Despite many studies and varied policies and programs, a strong sense of uncertainty about the effects of human action is still the most accurate characterization of our understanding of the Delta today.

Far from being a prescription for paralysis, however, recognizing both uncertainty in knowledge and uncertainty about outcomes of policies and programs has very specific implications for future

Delta management. Managing a valuable resource of any kind under conditions of uncertainty calls for common sense wisdom – spread risks, create backups where possible, work in reversible steps, and learn from experience. The State of California must act decisively and deliberatively to reduce known threats, but must also adopt a long-range stewardship philosophy that results in a resilient Delta environment and a resilient water supply system for California.

Needed energies must be mobilized, often in the face of opposition. A related challenge is to adapt strategies over time as experience reveals unexpected consequences and science or technology creates new understanding and new tools. Current ways of making policy, providing incentives and distributing liabilities and financing need to change for this vision to be successful. The over arching issue for all these challenges is "governance."

California's Delta is its largest estuary and lies at the center of a complex statewide water system. This water system combines the massive engineered state and federal water projects with a diverse range of local water management activities. Despite its importance to California, uses of the Delta are not governed effectively. No current governance structure effectively addresses the range of policy issues or threats facing the Delta today. There are at least 220 governmental agencies with some authority for different aspects of the Delta. Moreover, there are only weak ways to organize existing agencies and jurisdictions toward broad functions in the Delta. Additionally, there are also incentives to misuse or overuse Delta water that ensure a constant oversubscription of the resource.

Effective governance is necessary to improve the Delta's estuarine ecosystem and capacity to export water. The first issue to address is what needs to be governed in order to meet the charge of "sustainable management of the Delta?" This vision identifies five areas needing governance:

1. Integrating the two critical co-equal values of ecosystem and water system functions into policies and investment choices, while incorporating the other values society seeks through the Delta.
2. Shaping land forms and land uses within the Delta and critical nearby areas consistent with this vision.
3. Integrating management of Delta-relevant water systems and ecosystem protection and improvement projects, including the authority to adjust rapidly to achieve the stated goals.
4. Shaping decisions in the Delta watershed which affect Delta water flows (quantity, timing, quality).
5. Establishing policies which improve water uses across California, including conservation, system efficiencies and improvements that lead to regional self sufficiency, and permit the reasonable exchange of water among users.

For the first area of governance, of integrating the two co-equal values, a single entity with a statewide perspective is needed. This entity would ensure integrated action to implement this vision, including application of the constitutional principles of reasonable use and public trust.

That entity must have (a) sufficient authority, including over ecosystem improvements and water diversions and exports, (b) sufficient financing to sustain activities over decades, including ability

to impose fees on those who use water resources from the Delta watershed or otherwise impact the Delta ecosystem, (c) have clear, effective working relationships with federal and local agencies and officials and (d) incorporate contributions of stakeholders, probably through structured collaborative processes, and (e) be supported with state and federal policies which align incentives and costs for individuals, businesses and others with the vision.

In addition to this single entity, other structures will be needed to address critical issues or to provide arenas for needed stakeholder and expert participation in decision making processes. For example, the second area of governance involves parcel specific land use decisions within the Delta required to achieve the vision. These decisions would be made within the policies adopted by the first entity. This responsibility should be the charge of a separate body which includes heavy representation of relevant local governments.

This governance system must be supported by robust programs of science focused on improving understanding of the Delta and of the effects of policies and programs.

Further development of proposals on governance will occur as more detailed work will occur during the strategic planning stage of Delta Vision in 2008. Successful approaches to governance in all five areas identified above are needed but not yet identified. At this stage, seven attributes required for success of a governance entity are identified:

- Has needed authority
- Can make needed decisions balancing critical values
- Can ensure implementation of its decisions, including control of needed finances and sufficient legal authority
- Is responsive to society and major constituencies
- Is accessible to all and equitable in its decisions, meeting expectations for justice in our society
- Can change over time to better meet its goals
- Is supported by an effective financing system that receives funds from those who benefit from use of the public resource or public policies where ever possible

The existing entities charged with major roles in governing the Delta relevant to the five identified areas do not have all of these attributes. In considering changes, it is desirable to use existing governance entities and systems where possible, but they are often hard to change, so major restructuring may be needed. When restructuring is required, it is important to clearly express new roles and remove old activities.

Additionally, governance is not just about institutions and policies. It is also desirable to join decision making, financing and liability wherever possible; this is a governance principle applicable from institutions to individuals. The opportunities and costs experienced by families, businesses, farmers, and other governments are affected by the policies of the State of California. Effective governance requires aligning these opportunities and costs in ways that support achieving desired policy goals.

It is reasonable to expect that progress on the vision will be uneven for several reasons: results from enacted policies will come in at different times; some interests will resist policy changes; and some policies will not work and need to be revised. This unevenness is one reason for designing governance systems with resiliency in mind.

ALTERNATE/ADDITIONAL language for consideration by TF members in italics:

If the State of California is to achieve the co-equal priorities we have identified, creating a new governance structure, with new authority, is essential. We will elaborate on the needed structure in our strategic plan, but tentatively conclude that the following elements may be appropriate:

a. ***A new, small governing body for the Delta should be appointed by the governor and confirmed by the State Senate.*** *The Delta ecosystem and water supplies for human uses are of co-equal statewide importance. The body appointed to achieve these results should not be another entity with a large number of members representing interest groups. Experience has shown that approach leads only to deadlock.*

b. ***The assigned duties of this body should include direct responsibility for the co-equal priorities of protection and revitalization of the Delta ecosystem and for a reasonable amount of water made available for human uses.*** *A major barrier to any change in California water policy is that the various interests do not trust anyone to make decisions that affect them. The result is absolute deadlock, the absence of a rational water policy, and periodic court orders or regulatory action dealing with limited issues. That approach is not working, and we believe only by entrusting a small group with the duty (and powers) to achieve the co-equal priorities, can California water policy improve.*

c. ***The new governing body should have the authority to approve, modify or reject plans and spending for both Delta ecosystem revitalization, and for protection of the water export system.*** *Yes, we recommend this body ultimately approve, change or reject proposals and plans --- and the spending of money --- to achieve these objectives. There is no ability to achieve a result without concurrent authority.*

d. ***The new governing body should have authority to approve, modify or reject specific levels of water exports.*** *It is of no surprise that many of the interests do not trust existing State of California agencies to plan or implement a new water policy. Although much of this distrust is unfounded in our judgment, it still exists. Accordingly, we believe that this new governing body should be authorized to approve, reject or modify any recommended level of water exports from the Delta. Yes, we are aware of water contracts, assertion of water rights, the implications of federal laws and regulations, but no better system suggests itself.*

e. ***During the strategic plan process we will decide whether to recommend that this new body have meaningful land use control over the Delta, or whether the Delta Protection Commission should be continued, with its powers expanded.*** *We have heard many opinions on how land use issues should be resolved in the Delta. In our strategic plan we intend to study and recommend steps to achieve this result. At the present time, the alternatives seem to be assigning this authority to the new governing body, or recognizing the existence of the Delta Protection Commission, continue the authority at that level, but expand and clarify the role*

f. ***The new authority should have the ability to impose on those who use water resources from the Delta watershed or otherwise impact the Delta ecosystem to finance the new duties and responsibilities.*** *It is impossible to ask a new governing body to undertake substantial changes and not provide the needed staff and organizational support, including funds. It appears appropriate to ask those who use water resources from the Delta, or those who are otherwise benefited, to assume the reasonable cost of that supervision.*

IV. The vision achieved

A vision is our hoped for future. It describes what that future would look like, how it will function, and what it will produce. It is something to which decision-makers should aspire. These are conditions we see as desirable if not ideal, challenging to achieve but not infeasible. The vision must result in a Delta that serves California for several generations. A vision is not a plan with targets, timetables, analysis of alternatives or costs. Equally though, a vision must convey confidence that it can be achieved and that requires discussions of policies and investments sufficient to warrant acceptance of the vision.

By the 22nd century, California's Delta is a vibrant and safe place to live, work and recreate. It is a place where the heart of California beats to a strong, steady rhythm of river flows, estuarine life and human activity.

The Delta will look different, with more areas experiencing tidal flows and broad corridors of natural and semi-natural habitats connecting marsh to extensive uplands. The Delta will also be used differently, with land uses, water exports and recreational uses that respect and work with the natural processes of the estuary.

As this vision is realized, California's Delta will be a place where foresight, learning and flexibility have resulted in a fruitful integration of the environment and the economy. In the 22nd century, California's Delta is a showcase for the nation and the world of how to integrate nature and technology. In the 22nd century, California's Delta functions as an integral part of a vital estuary, teeming with life. In the 22nd century, Californians have reliable supplies of high quality water from many sources, including the Delta.

At the core of this vision is the recognition that water resources are a public trust, a resource both provided by, and critical to, functioning ecosystems. Water supplies for future generations must be provided while maintaining other ecosystem values, for which a resilient ecosystem is essential. A resilient ecosystem can withstand and rebound from disturbances, and thereby continue to provide values desired by society. The public trust doctrine applies both to water under management and to the tide and submerged lands that are the foundation of the Delta ecosystem.

As the vision is achieved, **the two co-equal values of ecosystem function and water provision will be deeply woven into the institutions and policies** through which California mobilizes public resources to achieve a vision for the future. This principle of equality does not mean that these two values will somehow be precisely balanced in every policy or management decision. Rather, it means that each is indispensable to the whole state and that each must be advanced in any decision. The sum of our actions must secure the future of both, ideally through choices which integrate the two values. This will result in change in historic ways of using the Delta and its watershed.

As the vision is achieved, **the Delta will function more effectively as part of an estuary**. The land forms and water areas of the Delta will change, including subsidence reversal on selected islands, improved flood plains and increased salt water and fresh water marshes, for example. Sufficient water flows will sustain the estuary.

As the vision is achieved, **all areas of the State of California will have increased regional self sufficiency and water conservation will be the ethic underlying water policy**. Additional, alternative ways to move water among areas of the state will be developed. A revitalized ecosystem may require reduced diversions or changes in the patterns of those diversions, upstream, within the Delta or exported from the Delta. As the vision is achieved, water management practices will have adapted to those changes.

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Equally importantly, new housing development cannot be allowed to compromise the flood protection for existing Delta residents and businesses. New housing developments in floodplains constrain flood conveyance capacity and can increase the threat of levee failure in surrounding areas and downstream. Areas suitable for the creation of new flood bypasses to protect existing Delta residents and services must also be kept free of housing developments. Recent court decisions on liability for levee failure have heightened the urgency of these issues for state government. ¶
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Finally, land use policy must recognize that many areas at the Delta periphery that are under the greatest pressure for urbanization are also indispensable to the long-term management of the ecosystem and water supply. As sea level rises, the geographical areas suitable for tidal wetlands regeneration will shift accordingly – but only if they have not been paved over or cut off by levees. Floodplain habitats on all rivers entering the Delta can provide crucial rearing and migration habitat for key fish species, but these functions would be greatly diminished by the presence of housing developments. Lastly, the most logical rights-of-way for any isolated conveyance facilities also pass through areas that are under significant urbanization pressure. ¶
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Even the expectation of future development will make preservation of these key Delta functions dramatically harder. Habitat restoration and water conveyance routing require land acquisition that will be far more expensive if land prices are determined by speculation on future development. As a result, efforts should be made to prevent a rush to establish development entitlements before appropriate Delta protections are in place.¶
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Given the fragmented nature of institutions in the Delta today, this coordination will be best achieved by a new planning area that encompasses (but does not replace) the existing boundaries of the Delta Protection Commission. The geographical boundaries of this planning area should extend beyond the existing legal Delta to incorporate adjacent areas where land use choices will have a substantial impact on the fate of the legal Delta. This boundary should also be set in accordance with a relevant, coherent and defe... [20]

As the vision is achieved, **California's Delta will be recognized as a unique place that has value** in its own right. It is not solely an infrastructure system or an ecosystem. The Delta is a place of natural beauty, valued first by Native Americans. It has a regional economy and a regional culture as old as any in California, consisting of historic towns, productive farming and close-knit communities. These values will be preserved in this vision of a future Delta.

This vision protects California's Delta from encroaching urbanization as critical to preserving its unique character and to public safety. Public safety and emergency response capacity must be high priorities to protect both local and statewide interests. Land use and governance contribute to protection of the Delta.

As the vision is achieved, **California's Delta is and will remain a powerful mixture of natural and human forces**. Humans will learn to work with natural processes to achieve desired goals in the Delta**.** Natural processes will accomplish much of the regeneration necessary for the Delta and its ecosystem functions. Humans will help. Human designs and engineering will support enhanced ecosystem function. For example, human cultivation of tules and wetland crops helps to rebuild subsided islands, or management of tidal action helps to recreate marshes. To achieve the desired goals in the Delta, California must blend these natural and human energies into a productive new synthesis that restores and sustains ecological and human values equally.

As the vision is achieved, **California will develop more capacity to anticipate and respond to powerful external sources of change**. Some of these sources are natural, like floods or earthquakes. Humans contribute to other sources of change, like urban growth or climate change. These external sources of change mean the physical configuration of the Delta as it exists today is not stable. The changes will happen, and achieving sustainable management of the Delta means designing physical and institutional forms that will allow the system as a whole – and the critical economic and ecological functions it provides – to survive what could otherwise be catastrophic shocks. Designs for seeking a static Delta against these changes will not achieve sustainable management.

As the vision is achieved, **California will have developed institutions and policies designed for resiliency**, both in the Delta and in the California water system as a whole. Resiliency means the ability of a system to adjust to disturbance without changing into a totally different system controlled by a different set of processes. A resilient ecosystem can withstand disturbances and rebuild itself in ways that are valuable to society. Resiliency for the water system means a statewide water system that has the ability to withstand disturbances in the environment and to be operated to meet changing demands. Resiliency for both the ecosystem and the water system also means that people need to reduce their reliance on water from any single source, including the Delta.

Fragile systems are those that rely on a few brittle parts, an accurate description of the Delta ecosystem and state water system today. Resilient systems rely on multiple mutually supporting parts, functional redundancies, and the capacity for gradual (not catastrophic) change in response to new conditions. Resiliency is necessary for the future. The Delta covers a large area with many different types of land forms and water channels. This diversity is an asset in designing for resiliency because it distributes functions and risks throughout the area. Figure 1 shows the diversity of the Delta.

As the vision is achieved, **water for human uses will be more effectively separated from water for the ecosystem** to achieve both increased water system resiliency and higher water quality for human uses and greater allocation of water for environmental purposes. The ecosystem cannot recover if it remains vulnerable to the upstream diversions and in-Delta water system operations of the recent past. Likewise, water system reliability cannot be achieved if ecosystem problems continually disrupt deliveries. As the vision is achieved, increased storage capacity and improved conveyance will be in place to capture water at times that are least damaging to the environment and efficiently move it to areas and times of need.

As the vision is achieved, **reliance on levees to protect Delta water, Delta lands, and humans is reduced and policies are in place to match levee designs to land uses protected by those levees**. The Delta ecosystem and water systems in the Delta rely on the 1,300 miles of levees that also protect all in-Delta water and land uses. Levees are critical to the Delta's future. Yet, existing levees are vulnerable to failure from earthquakes, floods, and structural decay. Multiple levee failures at one time in the Delta could flood dozens of islands, cause dramatic changes in the ecosystem, and halt all water exports from the Delta for years. Recognizing these possibilities does not mean abandoning the levees that define the Delta. It does mean that policies to reverse subsidence should be pursued, that decisions about infrastructure should seek to reduce reliance on levees, and that not all levees should provide equal levels of protection. As the vision is achieved, levees protecting urban areas will be designed to provide more protection than levees protecting agricultural land or recreational land.

V. Summary

Virtually every person who presented views to the Task Force echoed the premise of Executive Order S-17-06 under which we work: the current condition and uses of the Delta are unsustainable. Rising sea levels will lead to intrusion of salt water further upriver in the Delta, altering the ecology of fish and plants and contaminating waters withdrawn for diversion to agriculture and urban uses. Inevitable floods will inundate vast areas, overwhelm levees, destroy property and infrastructure and endanger lives in flood-prone areas. Less certain but potentially more catastrophic earthquakes could profoundly alter the physical geography of vast areas of the Delta, obliterating settled areas with major flooding, destroying bridges, levees, roads, power transmission, gas pipelines and buildings.

Our vision accepts the judgment that the current situation of the Delta is not sustainable. We recognize among all the uses that must be accommodated in planning for the future of the Delta two overriding priorities – ecosystem protection and water provision for human use.

By giving a priority to ecosystem protection we do not mean restoration to historic conditions that prevailed prior to the alterations that humans have effected over the past two centuries. We mean adapting patterns of construction, settlement and uses to enhance the functioning of the Delta as an integral part of the San Francisco estuary to the extent practicable within a relatively mature and developed economy.

By assigning a priority to water provision we do not envision any increases in available supplies for export outside the Delta. To do so would compromise our priority for ecosystem protection.

For success over generations, our policies for ecosystem protection and water provision must be designed not for one best solution, but for resiliency, for the capacity to recover from threats and adapt to changes many of which we cannot now predict with accuracy. We must also develop policies which respect and work with natural processes rather than seeking to bend nature to our engineering designs. Resilient natural systems help to sustain resilient human systems. We should also respect human aspirations and capacities and develop policies which mobilize the great energy of Californians to act individually and in families, firms and non-profit organizations rather than relying solely on state or federal governmental actions and regulations to achieve the desired vision.

We must govern differently, integrating policy making for ecosystem protection and water provision, protecting the Delta as a place of value and also of living communities, and achieving needed changes in water delivery and use across all California. The Delta watershed is critical to the future of California and changes in conveyance and storage are required, and these actions must occur as the ecosystem is protected and all California moves to a more efficient and resilient water system. Changed institutions, policies, financing systems and distributions of liabilities are required to move a fragmented system for decision making toward the vision proposed.

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Achieving durable, sustainable management of the Delta requires comprehensive, integrated policies, well-funded and pursued over decades through an effective governance system that ensures continuity of action while adjusting policies and programs as needed in pursuit of this vision.

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Appendix 1. Delta Vision Process

The governor's Executive Order S-17-06 (below) recognized the value of California's Delta and risks to its future. It formed the Delta Vision process to "develop a durable vision for sustainable management of the Delta" that can "restore and maintain identified functions and values that are determined to be important to the environmental quality of the Delta and the economic and social well being of the people of the state."

Four groups, each with a distinct charge, were established under the executive order. The seven-member independent Blue Ribbon Task Force is charged with developing the Delta Vision in 2007 and a strategic plan to carry out the vision in 2008. In their meetings, the Task Force members heard statements from scientists, stakeholders, government officials and the general public to assist in forming their vision. The Task Force also requested and received ideas and visions from the general public.

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The five-member Delta Vision Committee is chaired by the Secretary for Resources; other members include the secretaries for the California Environmental Protection Agency; the Business, Transportation, and Housing Agency; the Department of Food and Agriculture; and the president of the Public Utilities Commission. These cabinet members are charged to report to the governor about the vision and strategic plan in late 2008, and appoint the Stakeholder Coordination Group and the Delta Vision Science Advisors.

The Delta Vision process coordinates with and builds upon many of the ongoing but separate Delta planning efforts. Among these are:

- The Bay-Delta Conservation Plan
- Delta Risk Management Strategy
- Delta Regional Ecosystem Restoration Implementation Plan
- Ecosystem Restoration Program's Conservation Strategy
- Suisun Marsh Plan

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The 43-member Stakeholder Coordination Group consists of representatives from all major interests using or living in California's Delta. With dedication and understanding, these women and men had 13 days of meetings to develop and refine nine principles, two emerging visions for California's Delta, and a list of near term actions. These emerging visions were first presented to the Task Force in August 2007, and contributed greatly to forming the vision. Many of the ideas presented in the Stakeholder Coordination Group will be more fully addressed during the strategic planning process.

Two science advisors, Dr. Michael Healey and Dr. Jeffrey Mount, consult with the Task Force, the Delta Vision Committee and the Stakeholder Coordination Group and give advice about the scientific issues regarding the Delta. The science advisors formed an assessment team to review the scientific and technical issues found in the Stakeholder Coordination Group's two emerging visions and the eight external visions submitted by the general public.

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EXECUTIVE ORDER S-17-06

WHEREAS the Sacramento-San Joaquin Delta estuary, including Suisun Bay and Marsh (hereafter "Delta"), supports a unique and irreplaceable combination of environmental and economic resources. The Delta is a source of water for farmlands, growing communities and businesses and provides a unique estuarine habitat for many resident and migratory fish and birds, some listed as threatened or endangered species. It is an area that supports vital energy, transportation, communications and water facilities, and important agricultural, recreational and cultural resources. The Delta is of state and national significance and must be protected and managed effectively for the future well being of the people and the environment; and

WHEREAS the Delta is intersected by highways, roads, and utility lines critical to regional, state and interstate commerce and economy; and

WHEREAS the Delta is the hub of California's two largest water distribution systems, the federal Central Valley Project and State Water Project, and at least 7,000 other permitted water diverters have developed water supplies from the watershed feeding the Bay-Delta estuary, providing drinking water to about 23 million people and irrigation water to about 7 million acres of highly productive agricultural lands; and

WHEREAS recent events like the Lower Jones Tract levee failure and Hurricane Katrina, and recent findings that indicate a two in three chance of a major earthquake occurring in or near the Delta in the next fifty years, have raised awareness and concerns about the vulnerability of Delta levees. Failure of Delta levees can have devastating consequences on farms, communities, roads, railways, power and fuel transmission lines, water conveyance and quality, wildlife resources, and the local and state economy; and

WHEREAS threats such as an aging levee system, regional climate change, rising sea levels, seismic events and urbanization pose an imminent threat to the Delta; and

WHEREAS recent legislation, a number of planning efforts and scientists have affirmed that current uses and ecosystem health in the Delta are unsustainable over the long-term; and

WHEREAS there is growing recognition that prior Delta and Suisun strategic planning efforts have been too narrowly focused on only a few of the Delta's many uses and resources; and

WHEREAS the combined threats and changing conditions within the Delta require immediate attention because of the potentially catastrophic environmental and economic consequences if timely action is not planned for and undertaken; and

WHEREAS the existing complex system of Delta governance has been criticized because no one level of government is fully in charge, or capable of responding in an orderly and effective way to address and mitigate the range of threats to the Delta.

NOW, THEREFORE, I, ARNOLD SCHWARZENEGGER, Governor of the State of California, by virtue of the power vested in me by the Constitution and statutes of the State of California, do hereby order effective immediately:

1. I hereby initiate the Delta Vision and establish an independent Blue Ribbon Task Force to develop a durable vision for sustainable management of the Delta. Making the Delta more sustainable will require a concerted, coordinated and creative response from leaders at all levels of government, stakeholders, academia and affected communities, and will require significant private and public partnerships and investments. The Delta Vision is designed to accomplish these goals:

(a) Meet the requirements of Assembly Bill 1200 (Water Code Sections 139.2 and 139.4), Assembly Bill 1803 (Water Code Section 79473) and SB 1574.

(b) Coordinate and build on the many ongoing but separate Delta planning efforts.

(c) Assess the risks and consequences to the Delta's many uses and resources in light of changing climatic, hydrologic, environmental, seismic, and land use conditions. This assessment will look at:

• The environment, including aquatic and terrestrial functions and biodiversity.

• Land use and land use patterns, including agriculture, urbanization, and housing.

• Transportation, including streets, roads, highways, waterways, and ship channels.

• Utilities, including aqueducts, pipelines, and gas/electric transmission corridors.

• Water supply and quality, municipal/industrial discharges and urban and agricultural runoff.

• Recreation and tourism, including boating, fishing, and hunting.

• Flood risk management, including levee maintenance.

• Emergency response.

• Local and state economies.

(d) Develop a program for sustainable management of the Delta's multiple uses, resources and ecosystem. Sustainable management of the Delta means managing the Delta over the long term to restore and maintain identified functions and values that are determined to be important to the environmental quality of the Delta and the economic and social well being of the people of the state. As part of the Delta Vision, priority functions and values will be identified, and measures necessary to provide long-term protection and management will be evaluated.

(e) Develop a Strategic Plan to implement findings and recommendations for public policy changes, public and private investment strategies, Delta-Suisun preparedness and emergency response plans for near-term catastrophic events, levee maintenance options, and how to monitor and report performance.

(f) Develop recommendations on institutional changes and funding mechanisms necessary for sustainable management of the Delta. Recommendations may include a discussion of oversight, land use and implementation authorities.

(g) Inform and be informed by current and future Delta planning decisions such as those pertaining to the CALFED Bay-Delta Program, Bay Delta Conservation Plan, Suisun Marsh Plan, Water Plan, updates of related General Plans, transportation and utilities infrastructure plans, integrated regional water management plans, and other resource plans.

2. The Secretary of the Resources Agency as chair, and the Secretaries of the Business, Transportation and Housing Agency, Department of Food and Agriculture and the California Environmental Protection Agency, along with the President of the Public Utilities Commission shall be the Delta Vision Committee, for the Delta Vision. They shall undertake the following:

(a) Explore entering into agreements with private and non-governmental organizations to receive funding for Delta Vision. In addition, the Director of Finance may also accept monetary and in kind contributions to support the activities of the Delta Vision.

(b) Create a Stakeholder Coordination Group to involve local government, stakeholders, scientists, engineers, and members of the public in this effort to develop a Delta Vision.

(c) Select Delta Science Advisors from diverse scientific disciplines to provide independent review and advice to the Blue Ribbon Task Force on technical, scientific, and engineering data, analyses, and reports.

(d) Report to the Governor and the Legislature by December 31, 2008 with recommendations for implementing the Delta Vision and Strategic Plan.

3. I will appoint the members of a Blue Ribbon Task Force to include diverse expertise and perspectives, policy and resource experts, strategic problem solvers, and individuals having successfully resolved multi-interest conflicts. The Task Force will seek input from a broad array of public officials, stakeholders, scientists, and engineers. The Task Force will prepare an independent public report that will be submitted to the Delta Vision Committee and Governor that sets forth its findings and recommendations on the sustainable management of the Delta by January 1, 2008 and a Strategic Plan to implement the Delta Vision by October 31, 2008.

4. Upon submittal of the Delta Vision Committee's recommendations to the Governor and Legislature, the Delta Vision initiative shall terminate unless extended by another executive order.

5. This order is not intended to create, and does not create, any right or benefit, whether substantive or procedural, enforceable at law or in equity, against the State of California, its agencies, departments, entities, officers, employees, agents, or any other person.

IN WITNESS WHEREOF I have here unto set my hand and caused the Great Seal of the State of California to be affixed this28th day of September 2006.

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ARNOLD SCHWARZENEGGER

Governor of California

ATTEST:

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BRUCE McPHERSON

Secretary of State

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Appendix 2: Public Safety and Disaster Preparedness¶
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Human life and safety continues to be a top priority for the state. That is why protecting and enhancing the ecosystem and water supply in California's Delta is so important. Other aspects to public safety include preparing for and responding to disasters. Threats to human life and safety include flooding, earthquakes, and other catastrophic events like a toxic spill. The levee system in California's Delta is a critical concern in terms of a catastrophe and how the state can respond to it. ¶
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Flooding is the most common and damaging natural disaster in California. The principle catastrophic event facing California's Delta is flooding from levee breaks or intense storms. The levees also are vulnerable to earthquakes. More than 90 percent of the Delta's land area is within Federal Emergency Management Agency (FEMA) flood zones. Several initiatives looking at the potential statewide economic impact from Delta flooding recommend strengthening the Delta's emergency response program. ¶
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The Task Force identified potential actions regarding public safety and disaster preparedness. These actions fall into three broad categories: planning and capacity building, public education and disaster preparation, and longer term actions to reduce risks. Although images of New Orleans' flooding are in people's minds, what will happen in California's Delta is very different: the floods will be deeper and colder than what happened in Louisiana.¶
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Under planning and capacity building, the Task Force applauds the good work begun by the Delta Protection Commission and the Delta Counties in coordinating emergency preparedness and response planning. Such planning and coordination is needed at the statewide level. The statewide plan ought to establish clearly defined responsibilities and reporting relationships between local, regional, state, and federal authorities. ¶
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For items that can be started with a few months, the Task Force also recommends: (1) establishing benchmarks for recommending and demanding evacuations, (2) developing good regional evacuation plans that includes information about routes and places for evacuees to go ... [22]

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At the center of this vision is the recognition of water resources as a public trust, best understood as being both provided by, and critical to, the functioning of ecosystems. Water supplies for generations to come are dependent on strong ecosystems able to sustain diverse life forms -- ecosystems that are resilient and adaptive to inevitable change. The Public Trust Doctrine applies both to the water under management and to the tidelands that are the foundation of the Delta ecosystem.

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The Task Force identifies **the water system and the ecosystem of the Delta as co-equal values** that must be preserved on equal footing. California cannot sacrifice either the unique estuarine ecosystem of the Delta or the critical water supplies that power the state's dynamic economy. Recent events have suggested that failure to protect both will lead to a future of endless volatility and conflict, to no one's benefit.

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. The history of the Delta has been to secure water supplies first and then worry about environmental mitigation later. The levee construction that transformed the Delta from predominantly marshy areas into dry "islands" protected by levees which confined water to channels occurred before much appreciation of what was lost. Those transforming levees were also constructed in the absence of effective regulatory policies focused on ecosystem effects. Similarly, many water diversions from rivers in the Delta watershed or from within the Delta occurred before passage of the endangered species acts. Even under those acts, mitigation is project specific and focused on individual species. A piecemeal project mitigation approach is an insufficient basis for a durable vision for sustainable management of the Delta.

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In addition, **the Delta is a unique place** that has value in its own right. It is not solely an infrastructure system or an ecosystem. The Delta is a place of natural beauty, valued first by Native Americans. It has a regional economy and a regional culture as old as any in California, consisting of historic towns, productive farming and close-knit communities. These values should be secured in any vision of a future Delta.

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Public safety and emergency response capacity must be high priorities, to protect both local and statewide interests. Land use and governance considerations will be particularly important in that effort. Protecting the Delta from urbanization is critical to preserving its unique character and to public safety.

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California's Delta is and will remain a powerful mixture of natural and human forces. Therefore, **we must learn to work with nature to achieve desired goals in the Delta.** While human designs and engineering may support enhanced ecosystem function, as when human cultivation of tules and wet land crops helps rebuild subsided islands, or management of tidal action helps to recreate marshes, but much of the actual regeneration occurs by natural processes. The state must strive to blend these natural and human energies in a productive new synthesis that restores and sustains ecological and human values equally

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Over the coming decades, California's Delta will be subject to powerful external sources of change. The physical configuration of the Delta as it exists today is not stable. But achieving sustainable management has less to do with armoring a static Delta against these changes than with creating physical and institutional forms that will allow the system as a whole – and the critical economic and ecological functions it provides – to survive what could otherwise be catastrophic shocks. We must **design for resiliency**, both in the Delta and in the California water system as a whole

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Reducing reliance on the water from the Delta is critical to achieving resiliency in water systems: **the state must encourage regional self sufficiency** and develop alternative ways to move water among areas of the state. We should also **expect that water exports from the Delta will be reduced in the future**. Key not only to achieving resilience but higher water quality and better ability to manage the Delta ecosystem is **separation of water for human uses from water for the ecosystem**. The aquatic ecosystem cannot recover to a state of enduring success if it remains vulnerable to the operations of the water conveyance system. Likewise, water supply reliability cannot be achieved if species declines and other ecological problems continually disrupt deliveries. **New storage and improved conveyance must be constructed to capture water at times least damaging to the environment** and efficiently move it to areas of need

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Finally, **a durable vision for sustainable management of the Delta must be comprehensive**. It must integrate the values of ecosystem function and water supply, ensure that conservation and construction both occur and develop effective systems of storage and conveyance for water. The State of California must take a lead in developing and pursuing this vision, but it must also find effective ways to ensure joint action with the federal government and local governments, plus mobilizing the focused energies of Californians.

The vision accomplished: In the 22nd century, California's Delta is a vibrant and safe place to live, work and recreate. It is a place where the heart of California beats to a strong, steady rhythm of river flows, estuarine life and human activity.

As this vision is realized, California's Delta will be a place where foresight, learning and flexibility have resulted in a fruitful integration of the environment and the economy. In the 22nd century, California's Delta is a showcase for the nation and the world of how to integrate nature and technology. In the 22nd century, California's Delta functions as an effective estuary, teeming with life. In the 22nd century, Californian's have reliable supplies of high quality water from many sources, including the Delta.

Actions required to achieve this vision for California's Delta

A successful vision states important values, provides a common understanding of the desired goals, and motivates broad commitment and action. Achieving a vision requires contributions by governments, individuals, busi-

This is a draft vision of the independent Delta Vision Blue Ribbon Task Force. A vision is a picture of a hoped-for end result: what it would look like, how it will function, and what it will produce.

Please submit comments online to:
dv_context@calwater.ca.gov
or by mail to:
Delta Vision draft
650 Capitol Mall, 5th Floor
Sacramento, CA 95814

nesses and non profit organizations. One challenge in achieving a vision is identifying the institutions and public policy strategies by which it can be achieved. Another challenge is mobilizing the energies needed to pursue those strategies, often in the face of opposition, and to adapt strategies over time as experience reveals unexpected consequences or science or technology afford new opportunities. The over arching issue here is "governance" but identifying plausible public policy strategies with which to move toward the vision is of equal importance. Unless current ways of making policy, providing incentives, distributing liabilities and financing are changed, the new vision will not be achieved.

The essence of the challenge to governance in the Delta is that there is extraordinary value, extraordinary risk, and extraordinary uncertainty, all in the same place. Despite numerous past studies and varied policies and programs, prevailing uncertainty about the potential effects of human action is still the most accurate characterization of our understanding of the Delta today. The Delta is an extraordinarily complex system that in many ways defies

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Re-designing a system as vital and as complex as the Delta is a major challenge for California. The stakes in the Delta are so high that failure to accept this challenge is not an option. California has led the nation and the world many times in its foresight in environmental management, and must do so again now. Nothing less than the future of California's Delta, and a large portion of the state's economy, are at stake.

Governance

California's Delta is its largest estuary and lies at the center of a complex statewide water system that combines the massive engineered state and federal water projects with a diverse range of local water management activities. But despite its importance to California, uses of the Delta are not governed effectively. There is no coherent vision for the future of the Delta that effectively addresses the increasing threats and only weak ways to organize the existing agencies and jurisdictions toward broad purposes. There are also numerous legal, regulatory, and economic incentives to misuse or overuse Delta water that ensure a constant oversubscription of the resource.

No improvement in the Delta estuarine ecosystem, and no protection of existing exported water, is possible without new, effective governance. There are at least 220 governmental agencies with some authority for aspects of the Delta. We know of no individual who defends the current system of governance. Instead, almost everyone insists that a 'new governance structure' is needed. We agree, and will make our recommendations later. Pending that, however, the future governance system for California's Delta must be granted wide authority and have as its focus the achievement of the dual priorities we have identified: a protected and improved Delta ecosystem, and providing a reasonable amount of water for human purposes.

An effective governance system must do the following:

Make progress on the two critical values of ecosystem function and water provision while incorporating the other values society seeks through the Delta.
Have the authority to shape land forms and land uses within the Delta and surrounding lands, consistent with this vision.
Manage the operations of Delta-relevant water systems and ecosystem protection and improvement projects, including the authority to adjust rapidly to achieve the stated goals.
Shape decisions in the Delta watershed which affect Delta water flows (quantity, timing, quality).
Establish policies which improve water uses across California, including conservation, system efficiencies and improvements, which lead to regional self sufficiency, and permit the reasonable exchange of water among users.
Ensure effective working relationships with federal agencies and officials and also California local governments, while mobilizing focused energies of Californians in support of the vision.

The governance of these six areas need not be assigned to a single authority. However, all must be harnessed together to succeed. This can be achieved by identifying starting goals and using the full range of policy instruments.

These starting goals can inform the design of any governance system:

Has needed authority
Can make needed decisions balancing critical values
Can ensure implementation of its decisions, including control of needed finances and sufficient legal authority
Is responsive to society and major constituencies
Is accessible to all and equitable in its decisions, meeting expectations for justice in our society
Can change over time to better meet its goals
Is supported by an effective financing system that receives funds from those who benefit from use of the public resource or public policies where ever possible

In developing new governance systems, it is reasonable to expect that multiple policy tools will be needed to achieve this vision and that those tools will change over time. Progress toward the vision will by uneven, partly because results will come faster in some areas in others, partly the result of resistance by some interests and partly because some efforts will prove inadequate and require rethinking.

Three principles can guide design of governance systems:

> Join decision making, financing and liability where ever possible (from institutions to individuals)
>
> Use existing systems where possible, but they are often hard to change, so be ready to seek major changes. When change is required, seek the clearest expression of new roles and removal of old activities possible.

Use policy tools which affect behaviors of decision makers (private and public) without constant authoritative decision making or regulation, where possible.

Further development of proposals on governance will occur as the vision evolves and more detailed work will occur during the strategic planning stage of Delta Vision in 2008.

Policies to achieve a more resilient estuarine ecosystem

The Sacramento – San Joaquin Delta and Suisun Marsh are an integral part of the largest estuary1 on the west coast of North America and South America, connecting rivers originating in the Sierra Nevada to the Pacific Ocean. This estuarine environment was once phenomenally biologically productive, and is still essential to hundreds of aquatic, bird, mammal and plant species, including some that are unique to the region, such as the Delta smelt. The Delta and Suisun are also an indispensable part of the Pacific Flyway, which links all of North and South America and related marine areas in a vast migration corridor for hundreds of bird species. Finally, the Delta has historically supported lucrative commercial and sport fisheries of both native and non-native fish.

In developing policies to improve the Delta ecosystem, each of these ecological roles must be borne in mind. The Delta estuary, the flyway, and the fisheries all provide enormous value to the State of California, both as tangible economic assets and as a trust that we must steward for future generations.

The Delta's ecosystem must be regenerated so that it functions more like an estuary, combining tidal and quasi-natural riverine flow patterns within appropriate physical habitat types characteristic of the historic Delta. The Delta and Suisun must also contain thriving terrestrial habitats (including non-tidal freshwater wetlands on lands behind levees), and sport and commercial fisheries that have been important to the northern California's culture and economy for decades. These goals will require different portions of the Delta to be managed differently – not only land and water, but also different portions of the aquatic habitat.

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Figure 6 shows how water from the Delta watershed is used both within that watershed, in coastal urban areas and in the Tulare basin (where most use is for agriculture). As a result of these conveyance projects, the majority of Californians, in one way or another, use water from the Delta and its watershed. However, it is important to also understand that most water systems in California are local projects and that the State Water Project and the Federal projects

1 Estuaries are subject to tidal influence, mixing salt, brackish and fresh water at different locations according to seasonal river flows and tides.

provide modest supplies of the total dedicated water used in the state. (Figure 6. Upstream and export diversion from the Delta watershed.)

Figure 6. Upstream and export diversion from the Delta watershed.

More water is commonly exported from the Delta in average or dry water years than is exported during wet years. In wet years, about 4.6 million acre-feet of water is exported from the Delta; in average and dry years, water exports are about 6.3 million and 5.1 million, respectively. The current infrastructure for water conveyance and storage limits ability to capture and store water during high flows for use in dry years. Figure 7 shows these relationships. (Figure 7. Water balance in the Delta by water year type.)

Figure 7. Water balance in the Delta by water year type.

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This capture, storage and conveyance occurs under water rights law where the Central Valley Project or State Water Project, or other users, hold rights to divert water from upstream sources, store it in reservoirs and then convey in canals and by pumps to points of use. Water is essential to human life and health, and human consumptive uses are the top priority for developed water supply in California. Water supply, regardless of source, also is an important part of the state's economy. Thus, water is both an important natural resource and an important economic resource. There is great competition for the limited amount of developed water supply. A new attitude and approach to water supply development and water use must take hold in California.

The Public Trust Doctrine, well established in the American legal system, with roots back to England and parallel principles in other legal systems, provides a way to frame decisions about the use of water in the Delta and Delta watershed. In our legal system, water is not "owned" by any user, but the state and public retain ownership. Users gain the right for use of water in various ways (riparian, appropriative, etc.,) but those rights are conditional both as stated in the term "reasonable use," and by the underlying public trust for protection of the resource. The public trust doctrine should provide an ethic and foundation for public policy making regarding water resources in all of California and is especially relevant and important in the Delta.

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Reducing reliance on the Delta means building greater regional water self-sufficiency throughout California. The state has already developed most attractive storage opportunities; there is a dam at almost every highly effective site. The sites left for building dams often have high environmental impacts or high cost for their yield. Therefore, there have been few major dams constructed in California recently.

Figure 8 details the water sources for urban uses in California, confirming the pattern just discussed. All urban areas of the state rely on some water from the Delta and its watershed, but the proportions vary tremendously.

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California must also develop water from all available sources in order to reduce reliance on the Delta. Figure 9 is a summary of the analysis of potential water demand reduction or supply augmentation for eight strategies from Update 2005 of the State Water Plan. These strategies need to be further developed and pursued as possible.

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Though little recognized by most Californians, the Delta is a region of unique and irreplaceable cultural value. It is a place where Native Americans lived and harvested food, where river travelers have long passed between the Central Valley and the ocean, where America's only rural Chinatown was built and still stands, and where industrious farmers invented entirely new implements to work the unique Delta soils. In more recent times, it has been a recreational haven to millions of Californians, offering valued boating, fishing, hunting, and bird-watching – or simply the chance to partake of a slower pace of life for a time. Its agricultural lifestyle and rural quality of life contrast sharply with the intense urbanism of the Bay Area, Stockton, and Sacramento. From wine grapes, blueberries and pears to rice, corn and tomatoes, the Delta grows more than 90 different crops, producing more than $650 million in farm sales for the state and Delta economies. The combination of fertile soils, a moderating marine-influenced climate, proximity to market and the

accumulated experience with this unique farm region of generations of farm families, makes the Delta a key and valuable part of California's famed diverse and rich agricultural bounty

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These values must be preserved and enhanced in the future. With millions more people arriving in northern California over the coming decades, the Delta's role as a recreational retreat will become even more valuable than it is today. Indeed, with its rich mixture of habitats, farmlands, open spaces, watercourses, fisheries, and historic towns, the Delta could become a compelling new kind of tourist destination that mixes ecosystem restoration, outdoor recreation, and an active local economy. In addition, the Delta is home to several key infrastructure systems of statewide importance, including highways, railroads, aqueducts, electricity and natural gas lines, which cannot be allowed to fail for long periods of time.

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For all these reasons, there must be increased recognition, increased status, and increased protection of the Delta as a place, not just a water supply or a species habitat. The goals of regenerating the Delta estuary and securing critical infrastructure must not diminish the cultural and recreational value of the Delta. On the contrary, these must be mutually supporting. New investments to meet ecosystem and water supply objectives should complement efforts to enhance the Delta's recreational and tourism, and agricultural economy, and must not diminish disaster protection for critical infrastructure

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The Delta's land use pattern must enhance both the region's unique values and the overall resilience of the system. To preserve the Delta's place values, the region's landscape must continue to be dominated by agriculture, wildlife habitat, and recreation, with mutually beneficial mixtures of these wherever possible. Specialized forms of agriculture that are particularly well suited to the Delta must be encouraged, such as subsidence-reversing crops, carbon-sequestering crops, and wildlife-friendly farming practices.

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The Delta's recreation and tourism economies also should be the subject of active investment and promotion by private, non-profit, and governmental entities over the coming decades. Rather than being frozen in time, the Sacramento River legacy towns, the agricultural areas, and the wildlife habitats that attract visitors today must be allowed to grow and change in ways that are consistent with the overall regional character and with historic internal needs. New enterprises that present the Delta's values to the larger public should be allowed and encouraged. For example, the mutually beneficial co-existence of habitat restoration, recreation, agriculture and public education that takes place as part of the collaboratively managed Yolo Bypass Wildlife Area could be replicated elsewhere in the Delta

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To enhance the resilience of the system, however, land use choices should both protect human residents of all economic levels from disaster, and preserve management flexibility for the Delta over the long term. Housing development must be kept out of all flood-prone areas, including all areas below current or projected sea level and all areas in deep floodplains, whether within or outside of the existing Delta primary zone. Protection of human life is of supreme importance, and Delta floodplains are a fundamentally unsafe place for housing development even with new investments in levees.

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Equally importantly, new housing development cannot be allowed to compromise the flood protection for existing Delta residents and businesses. New housing developments in floodplains constrain flood conveyance capacity and can increase the threat of levee failure in surrounding areas and downstream. Areas suitable for the creation of new flood bypasses to protect existing Delta residents and services must also be kept free of housing developments. Recent court decisions on liability for levee failure have heightened the urgency of these issues for state government.

Finally, land use policy must recognize that many areas at the Delta periphery that are under the greatest pressure for urbanization are also indispensable to the long-term management of the ecosystem and water supply. As sea level rises, the geographical areas suitable for tidal wetlands regeneration will shift accordingly – but only if they have not been paved over or cut off by levees. Floodplain habitats on all rivers entering the Delta can provide crucial rearing and migration habitat for key fish species, but these functions would be greatly diminished by the presence of housing developments. Lastly, the most logical rights-of-way for any isolated conveyance facilities also pass through areas that are under significant urbanization pressure.

Even the expectation of future development will make preservation of these key Delta functions dramatically harder. Habitat restoration and water conveyance routing require land acquisition that will be far more expensive if land prices are determined by speculation on future development. As a result, efforts should be made to prevent a rush to establish development entitlements before appropriate Delta protections are in place.

Given the fragmented nature of institutions in the Delta today, this coordination will be best achieved by a new planning area that encompasses (but does not replace) the existing boundaries of the Delta Protection Commission. The geographical boundaries of this planning area should extend beyond the existing legal Delta to incorporate adjacent areas where land use choices will have a substantial impact on the fate of the legal Delta. This boundary should also be set in accordance with a relevant, coherent and defensible ecological or hydrological criterion, such as a future high-tide line or elevation line.

Much of the Delta consists of lands subject to the ebb and flow of the tide. These lands are subject to what is commonly known as the “tidelands trust,” under which the state holds them subject to a duty to see that they are used so as to preserve the people’s interest in such trust purposes as commerce, navigation, fisheries and ecological study. Generally speaking, the state’s interest in the tidelands extends to the ordinary high water mark.

As sea levels rise due to global climate change, the ordinary high tide line will move farther up the land in and around the Delta. In planning for the future of the Delta, and of immediately surrounding lands that may, in the future, be subject to tidal influence, state and local agencies have a duty to avoid activities that would injure trust purposes whenever feasible, and to mitigate them if they are unavoidable.

The proposed planning area must clearly designate the Delta as a special area, and should help inspire and guide investments in ecosystem regeneration, land acquisition or protection, and the recreation, agricultural and tourism economy. The investments themselves, however, should be made by a variety of actors, including private entrepreneurs, non-profit organizations, and government at all levels. This planning area must also ensure that all such investments conform with

the overall regional management goals of ecosystem regeneration, water supply reliability and quality, human safety, and preservation of the Delta's unique value as a place.

Delta levees

This vision's goals for the estuary, the water system, and the Delta region itself all require a reliable and recoverable levee system. Levees are the fine threads that stitch together the Delta estuary and landscape, and that make most current human uses of the land and water possible. As in New Orleans before Hurricane Katrina, however, the Delta's levees and the protection they provide are too often taken for granted. Levees require continual attention, investment and maintenance, especially in situations where they are protecting land below sea level. The care of Delta levees will therefore be a key responsibility for state and local government, and Delta inhabitants, in perpetuity.

Given the risks of levee failures and the requirement for continuing maintenance against increasing threats, the state should adopt two policies:

The state's reliance upon levees should be reduced wherever possible and avoided in the future.

The state should adopt standards for levels of protection afforded by levees of different design and determine allowable land uses in areas flooded when levees fail.

However, allowing numerous levees to fail (either gradually or *en masse*) is unacceptable because of the damage it would do to the Delta's regional economy and the functioning of the estuary, even if water conveyance were secure. And yet, fully fortifying all of the levees against the many threats they face – ranging from earthquake risks to subsidence to climate change – would be astronomically expensive.

For these reasons, levee management must emphasize recoverability from, rather than resistance to, failure scenarios of all kinds. After emergency declaration and resources mobilization, the limiting factor in the levee repair schedule would be the supply of rock for levee-end capping and breach closure. Capping and breach closure material would come from Dutra's San Rafael quarry because of its unique advantage of direct access to marine transportation. Rock from other quarries in the region without direct marine access would probably be required for Bay Area urban repair needs, making it unavailable for levee repair. Also, sufficient barge and tug capacity would be required to deliver the full production of the quarry to the rock placement. With these limiting factors, the repair period for multiple levee failures is projected to be a minimum of 28 months for a 50-breach scenario and 16 months for a 30-breach scenario.

Inundation of one island increases the chances of levee breaches on adjacent islands, so quick response to any levee failure is essential. In addition to siting materials, the state must pre-contract adequate barge capacity to move large amounts of material to levee breaches quickly. The state also must ensure that adequate human labor resources to repair breaches will be available and sufficiently mobile in the Delta after any potential disaster.

The state should also fund two focused programs of levee research. The first should assess the existing condition of the Delta levees. Levee composition, underlying soils, hydraulic forces and

other key conditions of levee integrity can vary almost on a yard-by-yard basis in the Delta. Existing information on these conditions is unacceptably poor and must be improved. The second program should be to research and develop more affordable and efficient seismic protection designs. Previous engineering experience with seismic retrofitting of dams suggests that such research could cut the cost of seismically secure levees by at least one-third.

Important policies outside the Delta are critical to achieving this vision

Because the Delta is central to California's natural hydrology and water system, any comprehensive vision to secure its future must include measures that take place outside of its legal boundaries. Indeed, in one way or another, much of the state of California is intimately connected to the Delta. Thus, the storage, conveyance, transfers and use of water throughout the state is of critical importance to the future of the Delta.

As has been noted, water conservation throughout the State of California is essential to accommodate trends in long-term population growth, climate change, and disaster risk. Water conservation strategies must begin by recognizing that not all uses of water are equally valuable. Water is a public trust, to be managed appropriately for identifiable public benefit and preserved for future generations. The sustenance of human life, the conservation of ecosystems, and the supply of critical economic activities must be explicitly recognized as the highest uses of California's water in all local water management decisions.

In addition, the state and local water agencies must vigorously investigate all opportunities for conjunctive management of reservoirs, floodplains, and groundwater aquifers. Conjunctive management that infiltrates more wet-season runoff into the Central Valley's groundwater aquifers, for example, has the potential to reduce flood pressure on the Delta and to expand local dry-season supply for the Valley's farmers. Conveying that water from surface reservoirs to infiltration sites through existing river channels can also help restore riverine habitats, especially in the dewatered reaches of the San Joaquin River. These conjunctive management strategies must also include the Tulare Basin, which, although not naturally hydrologically connected to the Delta, is a major consumer of Delta water for agricultural irrigation, and has very large groundwater storage potential.

Part II. Summary

Virtually every person who presented views to the Task Force echoed the premise of Executive Order S-17-06 under which we work: the current condition and uses of the Delta are unsustainable. Rising sea levels will lead to intrusion of salt water further upriver in the Delta, altering the ecology of fish and plants and contaminating waters withdrawn for diversion to agriculture and urban uses. Inevitable floods will inundate vast areas, overwhelm levees, destroy property and infrastructure and endanger lives in flood-prone areas. Less certain but potentially more catastrophic earthquakes could profoundly alter the physical geography of vast areas of the Delta, obliterating settled areas with major flooding, destroying bridges, levees, roads, power transmission, gas pipelines and buildings.

Our vision accepts the judgment that the current situation of the Delta is not sustainable. We recognize among all the uses that must be accommodated in planning for the future of the Delta two overriding priorities – ecosystem protection and water provision for human use.
By giving a priority to ecosystem protection we do not mean restoration to historic conditions that prevailed prior to the alterations that humans have effected over the past two centuries. We mean adapting patterns of construction and settlement to enhance the functioning of the Delta estuary to the extent practicable within a relatively mature and developed economy.

By assigning a priority to water provision we do not envision any increases in available supplies for transport outside the Delta. To do so would compromise our priority for ecosystem protection.

For success over generations, our policies for ecosystem protection and water provision must be designed not for one best solution, but for resiliency, for the capacity to recover from threats and adapt to changes many of which we cannot now predict with accuracy. We must also develop policies which respect and work with nature rather than seeking to bend nature to our engineering designs. Resilient natural systems help to sustain resilient human systems. We should also respect human aspirations and capacities and develop policies which mobilize the great energy of Californians to act individually and in families, firms and non profit organizations rather than relying solely on state or federal governmental actions and regulations.

We must govern differently, integrating policy making for ecosystem protection and water provision, protecting the Delta as a place of international value and also of living communities, and achieving needed changes in water delivery and use across all California. The Delta watershed is critical to the future of California and changes in conveyance

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We need to shift from current conditions toward future conditions on the basis of new principles for policy making:

Current conditions	*New Design Principles*	*Future conditions*
Delta as the critical hub in the infrastructure backbone of the CA water system	Design for resiliency in California and in Delta (ecosystem, water use, and flood management…)	Highly resilient California water system, built on regional self sufficiency, varied conveyance, improved storage (in ground and above ground), and effective ways to transfer water among uses and locations, with individual and provider incentives to use water efficiently.
Delta as a failing component of an estuary, with low productivity and declining species	Increase primary food production and overall ecosystem resilience by designing to enhance functioning as an estuary	Highly resilient Delta ecosystem, effectively functioning as an integral part of a unique estuary.
All uses completely dependent on marginal levees	Reduce reliance on levee wherever possible. Respect nature and work with nature to achieve desired goals	Levees remain important, but are designed, constructed and maintained to different standards for different uses requiring different levels of protection. Policy making should anticipate levee failures.
Managed primarily for water use, constrained by species protection laws. Levees for navigation and agriculture, un-linked to water management.	Respect humans and mobilize their energy to beneficial ends. Must integrate ecosystem, water supply/quality, and flood management.	California better manages dependence on Delta for water. Water from the Delta watershed will remain critical to California and reliable conveyance around or through the Delta will be important. But failure of any conveyance should not result in a major crisis.
Incentives to over use and abuse Delta (water use, subsidence, infrastructure routes, urbanization.)	Ecosystem function and water use are co-equal values in design and management of Delta and its watershed	Reduced risks to the Delta from human actions in and outside the Delta
Fragmented, weak governance	Sufficient authority, responsibility, and funding; effective integration across separate systems	Effective governance of water uses and water systems in California, of the Delta ecosystem, and of uses of all Delta resources

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Appendix 2: Public Safety and Disaster Preparedness

Human life and safety continues to be a top priority for the state. That is why protecting and enhancing the ecosystem and water supply in California's Delta is so important. Other aspects to public safety include preparing for and responding to disasters. Threats to human life and safety include flooding, earthquakes, and other catastrophic events like a toxic spill. The levee system in California's Delta is a critical concern in terms of a catastrophe and how the state can respond to it.

Flooding is the most common and damaging natural disaster in California. The principle catastrophic event facing California's Delta is flooding from levee breaks or intense storms. The levees also are vulnerable to earthquakes. More than 90 percent of the Delta's land area is within Federal Emergency Management Agency (FEMA) flood zones. Several initiatives looking at the potential statewide economic impact from Delta flooding recommend strengthening the Delta's emergency response program.

The Task Force identified potential actions regarding public safety and disaster preparedness. These actions fall into three broad categories: planning and capacity building, public education and disaster preparation, and longer term actions to reduce risks. Although images of New Orleans' flooding are in people's minds, what will happen in California's Delta is very different: the floods will be deeper and colder than what happened in Louisiana.

Under planning and capacity building, the Task Force applauds the good work begun by the Delta Protection Commission and the Delta Counties in coordinating emergency preparedness and response planning. Such planning and coordination is needed at the statewide level. The statewide plan ought to establish clearly defined responsibilities and reporting relationships between local, regional, state, and federal authorities.

For items that can be started with a few months, the Task Force also recommends: (1) establishing benchmarks for recommending and demanding evacuations, (2) developing good regional evacuation plans that includes information about routes and places for evacuees to go; (3) practicing those emergency response and evacuation scenarios with citizens as well as emergency response personnel; (4) stockpiling and pre-positioning supplies; (5) earmarking money and giving spending authority for rapid response; and (6) signing contracts for barges along the West Coast to move people and supplies. In a major event, the state will likely need help from other states.

Public education and preparation also is essential to reducing losses of life and property. A state goal ought to be that every Californian is able to care for themselves and immediate family members for the first 72 hours of a disaster. This preparation includes tangible actions such as setting up a Boat Marshal Program

for rapid evacuation of neighborhoods. Changing building codes to require exits to a building's roof from the inside will help save lives. To address human tendencies to underestimate risks and to avoid disaster preparation, lampposts on every block behind levees ought to be painted showing the 100 year flood level. School programs about emergency training are also necessary.

Longer term actions are needed to reduce the risks and impacts of a flood. The Task Force recommends that the state begin acquiring floodplains, establish bypasses where feasible, and disallow residential building in flood prone areas. The state needs to set up a policy for levees regarding protecting heavily populated areas and key parts of California's Delta's ecosystem.